

Adaptive Firmware Card™

Operator's Manual and Application Guide

System Software 4.0

*for the Model G32
Adaptive Firmware Card*

and the Apple IIgs®

Don Johnston Developmental Equipment, Inc.
PO Box 639, 1000 Rand Rd., Bldg. 115
Wauconda, IL 60084
(312) 526-2682

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Operator's Manual and Application Guide
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INTRODUCTION

The Adaptive Firmware Card™ (AFC) was designed for people who want to use the Apple® computer but who cannot use the standard keyboard or who find a special-input method faster, easier, or simpler to use than the standard keyboard. The AFC — together with an input device, such as a single switch or an expanded membrane keyboard — may be thought of as an *alternate keyboard*. This alternate keyboard may be used on a par with the Apple keyboard to operate standard application software. It may also be personalized to best accommodate the abilities of the user and the requirements of the application software. A wide range of special-input methods are available with the AFC, and these methods may be used in a variety of creative ways. To introduce you to the Adaptive Firmware Card, we would like you to imagine two very different situations:

A BUSINESS SETTING:

You want to run your own business, and you could do so by means of a computer. Business-type programs are available which suit your needs, but these programs assume that you can use the standard keyboard. The problem is that you *can't* use the standard computer keyboard. You *can* use a single switch, so you want to find a way to operate the computer using one switch.

The Adaptive Firmware Card provides a solution to this problem. It will let you run business-oriented software with just one switch!

A SCHOOL SETTING:

You are a teacher in a classroom for preschoolers who have special needs. You have a computer, and you have educational software which you'd like your children to use. The problem is that the software assumes certain cognitive or motor abilities which your children don't yet have. You feel your children could use this software if they had a larger, specialized keyboard, with pictures rather than letters.

Although the second situation is very different from the first, the solution here is also the Adaptive Firmware Card! It will allow you to run the computer with an expanded keyboard and to arrange pictures or letters on this keyboard in any way that you choose.

The AFC is flexible enough to handle both of the above problems and a wide variety of others as well. To see how the AFC might be used to solve these problems, let's look at an example solution for each.

THE BUSINESS SETTING: MARK

Mark is in the situation of the business person. He selected AppleWorks® as the software he wanted to use. This is his *application software*.

He also selected a switch which he uses well. This is his *input device*.

After reviewing and trying out the various single switch methods with the AFC, Mark selected regular scanning as his *AFC input method*. With some practice, he found he could use this accurately when the rate was set to 7 — he plans to gradually increase his rate as he continues to practice. He used a scanning overlay which displays all the characters on the Apple keyboard. (Terms such as "rate" and "overlay" will be described in more detail later.)

Of various *enhancements* available with the AFC, Mark found that two time-saving options were useful for him: AFC MACROS and AUTO-CAPS. MACROS allowed him to store and retrieve frequently used words and phrases by selecting just two characters. AUTO-CAPS automatically capitalized the first letter following a period.

THE SCHOOL SETTING: CHRIS

Chris is in the situation of the preschool teacher. She may have selected early childhood software, such as Charlie Brown's® ABC's, Stickybear™ ABC, or Hodge Podge, as her *application*

software. With this software, pressing any letter on the Apple keyboard produces a letter-related result. In Charlie Brown's ABC's, for example, pressing "C" brings up a birthday cake – pressing "C" again animates Snoopy blowing out the candles on the cake. Chris' students were at a younger level: she wanted to present them with eight large pictures as their keyboard, rather than numerous small computer keys, and she wanted them to press pictures of objects, such as a cake, rather than letters.

Chris selected an expanded keyboard, such as the Unicorn Expanded Keyboard, as the *input device* for her children. She made a paper overlay for this keyboard, dividing it into eight areas and drawing eight large pictures suitable for her software.

When using the Adaptive Firmware Card, she used the expanded keyboard method as her *input method*. She created a customized overlay on the AFC Menu Disk so that when a child pressed a picture on the expanded keyboard, the AFC sent to the computer the letter (such as "C") which the application software needed to produce the desired result (such as "cake"). In this way, her children only had to learn to press a picture to get a certain result.

In these examples, both Mark and Chris had to configure or "set up" the AFC to do what they wanted it to do with the application software they wanted to use. Depending on other applications they might have, they may want to set up the AFC in different ways. They may even want to be able to switch rapidly from one *setup* to another.

To handle this requirement, the AFC comes with a Menu and Construction Disk, which is used to store an Extended Menu of Setups. Each *setup* in the menu contains all the information needed — method, rate, overlay, enhancements — to tell the AFC what you want it to do in a particular application. Mark and Chris can use this disk to create (construct) up to 100 additional setups and add them to the Extended Menu of Setups. In everyday use, Mark and Chris only need to turn on the AFC, select the appropriate setup, and run their application software.

AFC INPUT METHODS

As you have seen in the examples for Mark and Chris, the Adaptive Firmware Card allows you to use one or more switches, an expanded or miniature keyboard, or specific other input devices to run software which is usually operated through the standard Apple keyboard. To use a special keyboard, such as the Unicorn Expanded Keyboard or TASH Mini Keyboard, you would choose a setup with the AFC expanded keyboard method. To use one or two switches, you might choose a setup with scanning or Morse code as the method. The AFC input methods fall into seven broad categories:

1. The **assisted keyboard method** provides assistance to one-finger or headwand/mouthwand typists, who use the standard Apple keyboard but have difficulty with the AUTOMATIC REPEAT and with holding down two or more keys at the same time.
2. The **expanded keyboard method** allows you to operate the Apple from an expanded or miniature keyboard.
3. The **Morse code methods** enable you to run the computer by sending Morse code via one or two switches.
4. The **scanning methods** allow you to press a single switch to bring up a line of characters on the second-to-bottom line of the computer screen. You run the computer by using your switch to select items from this line of characters.
5. The **multiple switch box method** allows keyboard-like operation from 1-2 switches connected to the I/O box or from 3 or more switches connected to a multiple switch box.
6. The **normal-input method** allows switches to work in parallel or in place of game buttons. This is useful when the program you are running was written for switch input.
7. The **ASCII-input methods** allow you to run the computer by means of certain portable communication devices. A special cable is needed from the device to the Adaptive Firmware Card I/O box.

WHAT DO YOU NEED TO READ?

You do not necessarily have to read every chapter in this manual! Following the next few pages (Installation, Getting Ready, and Getting Going Quickly), the manual is divided into three major parts:

- I: Operations
- II: Input Methods
- III: Enhancements

If you are new to the AFC:

1. Read **Installation**, if you are installing the AFC.
2. Read **Getting Ready** (follows Installation).
3. In Part I (Operations), read **Chapters 1-3**. These provide hands-on demos which get you up and running quickly. These chapters also explain concepts and terms which will be important in your day-to-day use of the AFC.
4. In Part II (Input Methods), read **the chapter on the method** or methods you plan to use. Detailed tutorials are provided.
5. Refer to **other chapters as needed** or as they interest you.

If you are already an independent AFC user (you use an AFC input method for full keyboard access):

1. Read **Installation**, if you are installing the AFC or want to know how it is installed.
2. Read **Getting Ready** (follows Installation).
3. Read **Getting Going Quickly: For the Independent User** (follows Getting Ready).
4. In Part II (Input Methods), read **the chapter on your input method** for a detailed discussion of all the features of that method.
5. Read **other chapters as needed** or as they interest you. Chapters 1-2 explain concepts and terms unique to the AFC. Chapters 4-7 describe operation of the Quick-Start Menu, special options, and the

Menu and Construction Disk. Chapters 17-21 describe enhancements which may be particularly useful to you as an independent user.

INSTALLATION

The package you received should include:

1. A printed circuit card. This is the *Adaptive Firmware Card, Model G32*.
2. A plastic box with a red light, toggle switch, and connectors on it. This is the *I/O box*. Attached to it is a long ribbon cable, partially covered by black shielding. A grounding wire, ending in a ring, comes out from one end of the shielding.
3. This *manual*.
4. A disk labeled *AFC Menu and Construction Disk*.
5. A disk labeled *Sample Application Software*.
6. A small packet with a half-inch screw, a washer, a threaded fastener, and two pieces of *Dual Lock Fastener*.

Notice the connectors on your card and I/O box

Look at the cable coming from the I/O box. **The number of connectors at the end of cable from the I/O box should be the same as the number of connectors on your printed circuit board.**

- If the cable from the I/O box ends in a split cable with two connectors, the printed circuit card should also show two connectors near one edge. (If you hold the card with the black chips toward you and the edge with the gold fingers pointing down, the connectors will be near the left edge of the card.) This two-connector version of the card and I/O box began with Revision C of the AFC-G32 (marked "Rev. C," "Rev. D," etc. on the printed circuit board).
- If the cable from the I/O box ends with one cable and a single connector, the printed circuit card should shown only one connector near the edge. (If you hold the card with the black chips toward you and the edge with the gold fingers pointing down, the connectors will

be near the left edge of the card.) This one-connector version is an earlier version of the AFC-G32 (the original model or Revision B).

If the number of connectors on the card and I/O box are not the same, you cannot use this set. Contact Don Johnston Developmental Equipment, Inc.

Installation procedures

The procedure for installing the Adaptive Firmware Card inside the Apple IIGS computer and attaching the I/O box to the side is as follows:

1. **Turn the power off** — make sure that the power switch at the back of the Apple is OFF. If the computer has been ON, wait at least 30 seconds after turning it OFF before you connect or disconnect anything inside the computer. This is the time it takes the computer to "power down."

**** CAUTION: Inserting or removing any card while the power is on could result in permanent damage to both the card and the computer. ****

2. **Open the computer.** To remove the lid of the Apple IIGS, locate the lid latches on the upper back corners. Wrap your hands around the rear corners. Hold the lid latches in with your index fingers and push up on the lid with your thumbs. When the lid releases, lift it all the way off the case and put it to one side.
3. **Touch the power supply case** inside the computer. (This is the metal box on your left.) This will discharge any static electricity that may be on your clothes or body.
4. **Locate slot 5.** Locate the seven peripheral slots at the rear of the computer. These are numbered from left to right, 1 through 7. Slot 5 is to the right of the number 5. **The Adaptive Firmware Card *must* go in slot 5.** If you already have a card in slot 5, you will need to move it to another slot.
5. **Locate the rectangular hole behind slot 5.** We recommend this hole for threading the ribbon cable on the I/O box through to the inside of the Apple. (You can use one of the holes behind slots 6, or 7, if you prefer.)

6. If the hole is plugged by a piece of plastic and a metal retainer, **remove the plug** (from inside the case) by turning the metal retainer 90 degrees counterclockwise. Put the metal retainer and plastic plug aside, outside the computer.

If you have cards in slots 6-7, you can gain more working room by temporarily removing them at this time — First, *note the slot number for any card you want to remove*. Then, remove the card by grasping the edges, front and back, and pulling up with a rocking-back-and-forth motion. Even if the cards are connected by cable to the computer, you can usually lay them gently outside the computer while you work.

7. **Feed the I/O cable through the hole.** Place the I/O box on the table to the right of the computer, so the red light and ON/OFF switch face up. Feed the I/O cable through the hole. If your cable has two connectors, feed the connector on the longest part of the cable through first, then the second connector.

Bring the cable through the hole until $\frac{2}{3}$ of its length is inside the computer. There should be no twists in the cable inside or outside.

8. **Insert the card.** Hold the Adaptive Firmware Card (the printed circuit board) so that the "component side" (with the black chips) faces you. Locate the gold "fingers" on the bottom edge of the card. These will establish electrical contact when the card is inserted in its slot.

- **For the two-connector card:** Locate the two open connectors on the left edge of the card. Notice one is smaller than the other.
- **For the one-connector card:** Locate the open connector on the left edge of the card. The connector has a wing on each end. These can be snapped shut to a straight position or pressed open to an angled position. Push them open at this time. Notice the open square notch in the middle of the connector.

Hold the card over the computer. Rotate the card so that the "component side" (the black chips) are on your right, the end with the open connectors is toward the keyboard, and the gold fingers point down.

Position the card so that the fingers are over slot 5, and push the card gently but firmly into the slot with a slight rocking-back-and-forth

motion (from the back to the front of the computer) The fingers should go all the way into the slot, so that only the very tops may be seen.

9. **Connect the I/O box to the card.** Take the end of the cable coming from the I/O box.

- **For the two-connector card:** Examine the two connectors at the end of the cable. Notice one connector is smaller than the other. First, bring the larger connector forward and push it firmly into the larger connector on the card as far as it will go. Then bring the smaller connector forward and push it firmly into the smaller connector on the card, as far as it will go.

Note: to disconnect these connectors, start with the smaller one, then disconnect the larger one.

- **For the one-connector card:** Examine the connector at the end of the cable. Notice one side has a raised square notch – this matches the notch in the card's connector. Bring the cable connector forward and push it firmly into the card's connector as far as it will go, then snap the wings shut.

Note: to disconnect this cable, always open the wings first.

For either version:

**** CAUTION: The ribbon cable is somewhat fragile. Avoid bending it sharply and repeatedly. In ordinary use, this shouldn't be a problem, but in a situation where the card is installed and removed frequently, be especially careful of the cable-connector junction at the end connecting to the AFC. When connecting and disconnecting this cable, press and pull on the connector itself, rather than the cable. ****

Double check that the card is firmly seated and that the top edge of the card is horizontal. The black shielded section of the cable should pull back comfortably through the hole, with no twists.

10. **Secure the grounding wire.** The grounding wire is the small wire with a ring at the end, which emerges *outside* the computer from the shielding of the I/O cable. Securing this wire does not affect the

function of the Adaptive Firmware Card but serves to eliminate radio interference from the card.

Remove the screw, washer, and threaded fastener from the packet. Place the washer on the screw. Locate the arch-shaped notch at the top of the hole your cable goes through. From inside the computer, push the washer and screw out this notch. Hold the screw in place with one hand.

With the other hand, from outside the computer, place the ring from the grounding wire over the screw. (The screw and washer must be inside the computer, the ring outside the computer.) Screw the threaded fastener onto the screw so that the grounding ring is held securely in place.

11. **Mate the Dual Lock Fastener to the pieces on the I/O box.** You should have four pieces of Dual Lock Fastener — two pieces are on the back of the I/O box and two are loose. The two loose pieces have white backing on one side.

Take each piece of the loose Dual Lock Fastener and line it up with one of the pieces on the box so that the black sides face each other. Push the pieces together tightly. The white backing should still be in place — do not remove this backing.

12. **Attach the I/O box to the side of the computer.** Stand the I/O box up on the table, so that the red light and ON/OFF switch face up and the back of the box touches the computer case. Pull the box forward so it is almost halfway between the back of the computer and the front. The cable should feel somewhat loose. (If the cable is pulled too tight, it will produce a strain.)

Place something on the table, such as a ruler or eraser, to mark the front-edge position of the box.

Pull the box away and remove the white backing from the Dual Lock Fastener. Reposition the box on the table, next to the computer, according to your front-edge mark. Press the box firmly against the computer.

13. **Replace any cards you may have removed.** Be sure to position them over their correct slots. Push down as you did with the Adaptive Firmware Card — gently but firmly, with a slight rocking back-and-forth motion.

14. **Replace the computer lid.** Lay the front edge of the lid in the groove in the front of the Apple IIGS case, then lower the back edge of the lid into place. Press down on the back corners of the lid until you hear the latches click shut.

The installation is now complete. *DO NOT* change the slot settings in the Apple IIGS Control Panel Program. The default setting for slot 5 (Smart Port) is correct. If you change Slot 5 to "your card," the AFC will not work.

The Adaptive Firmware Card is a RAM-based card. To be operational, it must be *initialized*. This means that "system software" must be loaded onto the card from the AFC Menu and Construction Disk. To do this, you simply turn the AFC OFF and boot the AFC Menu and Construction Disk — you don't need to do that now, because you will be doing it in Chapter 1. The information on the card is maintained by the memory backup system described below.

15. Once you have read about the memory backup system below, please proceed to **GETTING READY**, then to **CHAPTER 1**.

THE AFC MEMORY BACKUP SYSTEM

The AFC memory will be kept "alive" after the computer is turned off by means of a memory backup system. The memory backup system relies on: (1) a "super" capacitor which is on the card and (2) the likelihood that you turn your computer on two or three times a week.

The important thing to know is: **If you don't turn your computer on for several days in a row, the AFC may lose its memory. To restore the AFC's memory, just turn off the AFC and boot the AFC Menu Disk.**

The reason the AFC keeps its memory, provided you turn on the computer every few days, is that the super-capacitor acts as a short-term storage battery. When the computer is turned on, even if you aren't using the AFC, this little "storage tank" charges up, and has enough capacity to retain the card's memory for up to a week. If you don't turn your computer on for several days, the super-capacitor will lose most of its charge, so it can't hold the AFC's memory. Booting the AFC Menu Disk with the AFC turned off restores the AFC's memory. While the computer is on, the super-capacitor will be recharging itself to hold the AFC's memory when the computer is off.

GETTING READY

In Chapter 1, you will try out the Adaptive Firmware Card and the AFC Menu and Construction Disk. Before you begin, you need to know what to have on hand, how to "back up" your disks, and how to attach special-input devices, such as a switch or a special keyboards. You will also need some information about the Control Panel Program of your Apple IIGS.

COPYING YOUR DISKS

Your disks are a very reliable place to store information, but disks can be damaged or lost. The best way to avoid problems is to store your disks in a protected place, away from dust, heat, moisture, direct sunlight, electrical, or magnetic fields. (For care and handling of your disks, see your Apple Drive Owner's Guide.) It is always good practice to back up your software, just in case something should happen.

We strongly recommend that you make a copy of your original disks and store the originals in a safe place. Use your copies as your everyday working disks — use the originals only to make copies from. To be extra safe, you could make two copies of each disk.

Your AFC disks are ProDOS® based. They are not copy-protected. You can make back-up copies by using the Apple IIGS System Utilities disk or any Copy program. (If you are not familiar with how to duplicate (copy) disks, see the Apple manual for your System Utilities.)

Note: **your working copy of the AFC Menu and Construction Disk must *not* be write-protected** — for the 3.5 Menu Disk to work, the square write-protect notch must be *closed* (so you can't see through it). For a 5.25 Menu Disk to work, the square notch on the side of the disk must *not* be covered.

ATTACHING SWITCHES OR KEYBOARDS

In using your AFC, you may be connecting or disconnecting switches, cables, or keyboards to the I/O box.

CAUTION: DO NOT CONNECT OR DISCONNECT SWITCHES OR CABLES WHILE THE COMPUTER IS ON. The static electricity that is discharged when a device connects or disconnects with the I/O box may be enough to cause the computer to "glitch" and cause the program being run to "crash." While this will not cause permanent damage to the computer, it may introduce errors on the AFC, with unpredictable results.

If turning off the computer is not convenient, you should at least switch the AFC OFF while connecting and disconnecting devices. If erratic performance does result, you will need to boot the Menu Disk with the AFC off — this will renew the AFC's memory. (See Troubleshooting, Appendix A.)

With those cautions in mind, let's take a look at the I/O box which you attached to the side of your Apple.

The AFC I/O box has:

- **an ON/OFF toggle switch.** This is where you turn your AFC ON and OFF. *When the AFC is turned OFF, the computer should behave as if the the AFC were not there.* The AFC may be turned on or off while a program is running – without interfering with the program – as long as the disk drive light is not on. *Do not flip this switch if the disk drive light is on:* this may cause your program to crash and may introduce errors on the disk or the card.
- **two mini-phone jacks** where you connect one or two switches. *When you are using only one switch, it should be plugged into the jack marked switch #1, as shown above.*
- **a 36 pin connector** where you can connect an expanded or miniature keyboard, a multiple switch box, or an ASCII communication device. See Appendix B if you need technical information about the 36 pin connector.
- **a red IN-USE indicator light (LED).** This light is ON when the AFC is active, that is, when the toggle switch is in the ON position.

WHAT TO HAVE ON HAND AS YOU READ THE MANUAL

Some of the following items are optional and are marked as such.

COMPUTER WITH ADAPTIVE FIRMWARE CARD INSTALLED

If your AFC is not installed, see the preceding section,
INSTALLATION.

SWITCHES, SPECIAL KEYBOARDS – recommended

The Adaptive Firmware Card is designed to allow control of the computer by means of switches and special keyboards. If you will be using such equipment with the AFC, we recommend you use it with the examples in this manual. You may use the OPEN-APPLE and OPTION/SOLID-APPLE keys in place of switches, if you prefer.

AFC MENU AND CONSTRUCTION DISK

The AFC Menu and Construction Disk is the disk that you will use most frequently with the AFC. We will usually just call it "The Menu Disk," for short. This disk contains an "Extended Menu" of AFC setups that are ready to use and provides room for you to add more. (The limit is 100 setups!) This disk also contains the programs you may later use to "construct" (create) your own setups and add them to the Extended Menu. Booting the Menu and Construction Disk, with the AFC turned OFF, automatically renews the memory on your Adaptive Firmware Card.

YOUR OWN APPLICATION SOFTWARE – as desired

Application software, in this manual, means the software that you wish to run by means of the AFC, such as AppleWorks or an educational program. This manual steps you through activities using very simple programs on the Sample Application Software Disk (see below), so you don't need to have your own

application software right away. You may, of course, begin to use your own software with the AFC whenever you choose.

SAMPLE APPLICATION SOFTWARE and TALKING WORD BOARD

This disk contains some sample application programs that you will use in exploring the AFC through hands-on activities described in this manual. Be sure to have this disk on hand when you begin Chapter 1.

The Talking Word Board program, included on this disk, is not really a "sample" program. If you want to use your alternate keyboard or matrix of switches as a talking word board — that is, to talk and *not* to run other application programs — you would use the Talking Word Board program. This program is described in the chapter titled THE EXPANDED KEYBOARD but is not discussed in detail. For specific instructions regarding the Talking Word Board, load the Talking Word Board program, and select '0' for INSTRUCTIONS.

SPEECH SYNTHESIZER – optional

The AFC provides the option of speech feedback for any AFC input method. This means that when you select characters from an AFC overlay the name of the character is spoken by the synthesizer, as feedback to you.

To utilize the speech feedback option, you need to have one of the following types of speech synthesizers installed in your computer:

- An external speech system which connects to the computer by means of a serial card, such as the Type 'N Talk® or the Personal Speech Synthesizer® by Votrax, Inc. and the DECtalk by Digital Equipment Corporation.
- An Echo™ II, Echo+, or Echo IIb Speech Synthesizer by Street Electronics Corporation.

WHAT YOU NEED TO KNOW ABOUT YOUR APPLE IIGS

Part of the versatility of the Apple IIGS lies in the Control Panel Program which resides in every machine. The settings in the Control Panel will affect the speed of your application program, the booting of disk drives, the operation of some peripheral cards, the color and resolution on the screen, the volume of the speaker, and more.

We describe some settings in the Control Panel which may affect your success in using the AFC with certain programs. If you are unfamiliar with the Control Panel, please read Appendix A, "The Control Panel Program," in the *Apple IIGS Owner's Guide* (pages 108-131).

ENTERING THE CONTROL PANEL

You can enter the Control Panel in several ways. The most common way is to press APPLE-CONTROL-ESC. If this doesn't work, try OPTION-CONTROL-RESET or hold down the OPTION key when you first turn the computer on.

From any of these entry points, a screen appears from which you choose Control Panel. On the Control Panel are several options you can select and explore. These include Slots, System Speed, Display, and Sound.

SLOTS

The Slots option lets you activate certain slots or ports in different ways.

The AFC: Slot 5

Your AFC should be installed in Slot 5. With some cards, you must set the slot setting (such as 5) to "Your Card" for that card to work. This is NOT true of the AFC: **you must keep Slot 5 set to "Smart Port"** (the default setting) for the AFC to work.

The mouse: Slot 4

You must keep Slot 4 set to "Mouse Port" (the default setting) for the Apple mouse or AFC mouse emulation to work.

Echo Speech Synthesizer: Slot 4 or 7

For use with the AFC, we recommend installing the Echo Speech Synthesizer in Slot 4. If problems arise when using the AFC with specific Echo programs, try moving your Echo to Slot 7. If the Echo is in Slot 4, don't set Slot 4 to "Your Card" — this would turn off the mouse. If you keep Slot 4 as "Mouse Port," the mouse stays on and the Echo works just fine.

Disk Drives and Startup Slot

For your disk drives to work properly, the slot settings in the Control Panel must correspond to how the drives are connected. See the manual *Setting Up Your Apple IIGS* for information on connecting disk drives. See page 122 of the *Apple IIGS Owner's Guide* for information on the proper slot settings.

The Startup Slot option tells the computer where to look for a disk drive when it's time to boot a disk (such as when you turn the power on or when you press CONTROL-APPLE-RESET). If you want a particular drive to boot first, check the setting for Startup Slot. (See page 123 of the *Apple IIGS Owner's Guide*.)

SYSTEM SPEED

The Apple IIGS has two speeds: Fast and Normal. Software written for the Apple IIGS was written to run at the Fast speed. Software written for the Apple IIe, on the other hand, was written for the slower Normal speed. If you run older software with the Apple IIGS set at Fast speed, the software will speed up and may or may not work properly. In particular, older programs that use the Echo Speech Synthesizer may not talk at all if the speed is Fast.

If older software is running too quickly or incorrectly, set the system speed to Normal, and reboot the disk.

You can observe the effect of Fast and Normal speeds on older software by running TAG Sampler, Shapes Dragon, or Colors/Tones (on the AFC Sample Application Software disk) with the Apple IIGS set at Fast and Normal speeds.

DISPLAY

The Display option in the Control Panel allows you to change various features of the display on your screen, including the color of the text, background, and border. It also allows you to change Type of Display to Color or Monochrome.

If the text for your application program, for the AFC prompts, or for the AFC scanning array is fuzzy or has a color fringe, try changing the Type of Display option to Monochrome.

If you are running an application program that should be in color and it's not showing color on your color monitor, set the Type of Display option to Color.

SOUND

The Sound option lets you raise or lower the volume of sound and the pitch of beeps which come from the computer.

If the tones for scanning or Morse code or the expanded keyboard are too loud or too soft, use the Sound option to set the volume lower.

FINAL NOTE

When you make changes in the Control Panel, these changes do not always take affect when you exit the Control Panel. If the new changes (such as slots or system speed) do not seem to have any affect, reboot your application disk. Some changes do not go into affect until you reboot the disk.

GETTING GOING QUICKLY: FOR THE INDEPENDENT USER

If you are an independent AFC user (you use an AFC input method for full keyboard access), the following steps will get you "up and running" quickly:

HAVING YOUR METHOD ACTIVE AT STARTUP

The AFC is shipped from the factory with a setup called "Normal" in the #1 position — this means only the Apple keyboard, *not* an AFC input method, is active at startup. To have your method active at startup, and to have it active while using the Menu and Construction Disk, you need to (1) decide which setup on the Menu Disk is your *preferred setup* and (2) move that setup to the #1 position on the Extended Menu.

For a *preferred* setup, we recommend starting with the "S" setup for your input method, such as "S.Unicorn," "S.Scan.ETA" or "S.Morse," etc. The "S" setups, at the beginning of the Extended Menu, each contain a standard full-access overlay for that input method. For help using the "S" setup for your method, see the chapter for your input method. You can change the rate in this setup to a rate that is comfortable for you.

When you know which setup is your preferred setup, have a friend move it to the #1 position on the Extended Menu. Here are the steps:

1. Boot the AFC Menu and Construction Disk.
2. Move the highlight (the cursor) to your preferred setup.
3. Hold down the CONTROL key, then press 'R' (for Rearrange).
4. Use an ARROW key to move the highlighted setup to the the very top of the Extended Menu — this is the #1 position, above the double dotted line.
5. Press RETURN when done OR press ESC to cancel the move.

The setup you moved to the #1 position will now be active as soon as you turn on the computer, provided the AFC is turned on. This setup will also be active whenever you use the AFC Menu and Construction Disk.

This will give you full access to the computer at almost all times, as long as the AFC is turned on.

IN DAY-TO-DAY USE

Now that your preferred setup is in the #1 position, all you need to do on a day-to-day basis is:

1. Leave your AFC turned ON at all times.
2. Have your application disk in the drive.
3. Turn the computer ON.
4. You will hear a tone and see the AFC QUICK-START MENU. Your preferred setup will be in the #1 position and will be immediately active.
 - **To get going with the #1 setup** and your application disk, simply use your AFC method to select or send RETURN. Your application disk will boot, and you will be in business.
 - **To select any other setup** on the Quick-Start Menu, use your AFC method to move the cursor to the setup you want, then select or send RETURN. The application disk will boot, and the setup you selected will be active.

IN THE EVENT OF A "CRASH"

If the AFC has "crashed" (lost its memory), you will not hear a tone and the Quick-Start Menu will not appear. You may get garbage on the screen, or the computer may skip the Quick-Start Menu and the application disk will boot. If this occurs:

1. Make sure the AFC is turned ON. If it has been turned OFF, that will explain why you did not get a Quick-Start Menu. Just turn it ON and press or send CONTROL-A then zero. The Quick-Start Menu should appear.

2. If the AFC was turned ON and you did not get a Quick-Start Menu, you need to *reload memory* onto the AFC. To do this, just turn the AFC OFF and boot the Menu Disk. This automatically reloads the memory, provided your AFC is turned OFF.

As soon as the Extended Menu appears, you may switch the AFC ON — your method will be active. Send RETURN two times to load the #1 setup and put your application disk in the drive when instructed to do so.

CREATING YOUR OWN SETUPS

You may sooner or later want to create your own setups. For example, you may want to rearrange the characters in your standard overlay or you may want to add special options (Chapter 5), MACROS (Chapter 17), or MOUSE EMULATION (Chapter 18). For details on creating your own setups, see the chapter for your input method.

Note to Readers:

With the AFC software and throughout this manual, we use the phrase *press a key* to mean *send that character to the computer*. You may press the key on the Apple keyboard or, if you are an independent AFC user, you may use your AFC input method to press, send, or select that character. We will use the word "press" to mean any of these.

CHAPTER 1

TRYING OUT THE AFC AND THE EXTENDED MENU

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CHAPTER 1

TRYING OUT THE AFC AND THE EXTENDED MENU

This chapter will get you started with a quick hands-on demonstration of the Adaptive Firmware Card and will introduce you to some of the basic features of the Extended Menu of AFC Setups.

AN AFC DEMO

You will need the Sample Application Software disk and the AFC Menu Disk. These disks are not copy-protected. We recommend that you make back-up copies of these disks, keep the originals in a safe place, and work only with the back-up copies. That way, your originals will always be available. (See "Getting Ready" in the beginning of this manual.)

You will also need a single switch. With the Adaptive Firmware Card, you may use any of the following as your switch:

- any switch plugged into jack #1 on the AFC I/O box
- the right side of the Unicorn Expanded Keyboard
- the OPEN-APPLE key on the computer keyboard

If you want to connect a switch or expanded keyboard to the I/O box, please do so when the computer is OFF.


Using an Application Program

An APPLICATION PROGRAM, in the context of this manual, is any computer program which you want to use with the Adaptive Firmware Card. It may be a commercial program, a public domain program, or a program you wrote yourself.


The disk **SAMPLE APPLICATION SOFTWARE** contains a number of programs which are examples of application software. We'll be using those programs in hands-on examples throughout this manual.

Whenever you use the AFC with an application program, it's important to know as much as you can about the application program itself, that is, how it works when the AFC is turned off. If you are not the AFC user, you can turn the AFC off and use the program from the keyboard until you are familiar with it. If you are the AFC user, you may, at first, want to ask a friend to assist.

ALEX THE RABBIT: AN APPLICATION PROGRAM

In this demo, the application program will be Alex the Rabbit, by Apple Computer. The first step in the demo is to see how this program works when the Adaptive Firmware Card is turned OFF. Notes for a computer novice are in small print, marked by .

1. **Turn the AFC OFF** (flip the toggle on the I/O box away from the red light).
2. **Place the Sample Application Software disk in Drive 1.**
3. **Turn the computer ON.**

 When you put the disk in the drive, the label should be facing up and toward you.

Turning the computer ON automatically **BOOTS** the disk — you will see the red light on the disk drive turn on, and you may hear the disk drive whirr. **BOOTING** means the computer is reading the information on this disk and copying (loading) some of it into the computer's memory. You must wait while it does this.

After some credits, you will see a list of choices appear on the screen. This list is called a **MENU**.

Part of what the computer copied from the disk was this menu.
The menu, therefore, comes from the disk.

The menu from the Sample Application Software disk is a list of the programs on the that disk. One of the programs is Alex the Rabbit. You

may already be familiar with Alex, if you have used the Apple Presents Apple disk for the Apple IIe. This program is copyrighted by Apple and is used with Apple's permission on the Sample Application Software disk.

A highlight (extending across one line of words) is on the line 1: ALEX THE RABBIT. This highlight is called a CURSOR.

You can move the cursor (highlight) around by pressing the SPACE or ARROW keys or by typing the number that starts the line you want.

4. Move the cursor to ALEX THE RABBIT, then press the RETURN key.

☞ When the cursor is on an item and you press RETURN, you are SELECTING that item.

The drive light will go on, because the computer is now looking on the disk for the program you selected, Alex the Rabbit. Once the computer has found the program, it will LOAD (copy) it into memory. The drive light will then go off, and you will see on the screen a maze with a rabbit at the top and a carrot somewhere in the maze.

5. Read the instructions on the screen.

6. Press RETURN to begin this program.

7. Use the UP-, DOWN-, LEFT-, and RIGHT-ARROW KEYS on the computer to move Alex through the maze.

- Notice what happens when you send Alex into a wall.
- Notice what happens when you press keys which are not ARROW keys. Try not to press the ESC key, because that will take you back to the menu.
- Notice that nothing happens when you press the OPEN-APPLE key.

☞ The OPEN-APPLE key is one or two keys to the left of the SPACEBAR. The key is marked with the outline of the Apple logo. Pressing the OPEN-APPLE key is the same as pressing a switch or the game button on a paddle or joystick.

8. Experiment with Alex the Rabbit until you are familiar with how the program works.
9. When you are done, remove the Sample Application Software disk from Drive 1.

Using the Adaptive Firmware Card

Now you will load a SETUP onto the Adaptive Firmware Card and use a special-input device (rather than the keyboard) to run Alex the Rabbit. The AFC is capable of a great many tasks — *you tell the AFC what you want it to do by loading an AFC setup.*

If you want to plug in a switch for this demo, please turn the computer OFF before plugging the switch in. You may use the OPEN-APPLE key instead of a switch, if you prefer.

LOADING THE SETUP

1. Make sure the AFC is still switched to OFF.
2. Place the AFC Menu Disk in Drive 1. Boot the disk.

- If your computer is already on, you don't need to turn it off — hold down the CONTROL key and the OPEN-APPLE key, and, while holding these, press and release the RESET key. (On the Apple IIGS, the RESET key is above the other keys, marked with a triangle.)

Using CONTROL-OPEN-APPLE-RESET is the same as turning the computer off, waiting 30+ seconds, then turning it back on. Either way, you are clearing the computer's memory and booting whatever disk is in the drive.

- If your computer is off, just turn it on, and the disk will boot automatically.

3. Some credits appear on the screen. Provided your AFC is turned off, INITIALIZING AFC will flash briefly on the screen, then the *Extended Menu of AFC Setups* will appear. It will be similar to the screen shown below.

EXTENDED MENU OF AFC SETUPS		
Press '?' for help		
TITLE	INPUT	DESCRIPTION
Normal		Multi-user setting
.....		
S.Assisted	asst	any program
S.Unicorn	Unic	any program
S.KingMini	TASH	any program
S.Morse	code	any program
S.Scan.ABC	scan	any program
S.Scan.ETA	scan	any program
S.ASCII	KEI	any program
T.Assisted	asst	any program
T.Unicorn	Unic	any program
T.KingMini	TASH	any program
T.Morse	code	any program
T.Scan.ABC	scan	any program
T.Scan.ETA	scan	any program

☛ This menu came from the AFC Menu Disk.

A cursor (highlight) is on the word NORMAL.

TROUBLESHOOTING HINT: *The Menu Disk will not work properly if it is write protected.* If the disk is write protected, you may get the following prompt, instead of the Extended Menu:

```
>> DISK ERROR >>
This disk must NOT
be WRITE PROTECTED

Press RETURN to try again.
Press ESC to cancel
```

- ☛ To remedy this, take out the disk and turn it over. Look for the small black write-protect tab in one corner of the disk. If the tab is toward the edge of the disk and you can see through a square hole, this disk is write protected. To remove the write protection, push the tab to cover up the hole. Now the disk will work properly.

Put the disk back in the drive, and press RETURN. You should now see the Extended Menu shown in step 3 above.

4. Use the SPACEBAR, DOWN-ARROW, or RIGHT-ARROW key to move the cursor (highlight) down through the Extended Menu.
5. Don't stop when you get to the bottom of the page. Just hold the key down, and you will see the setups SCROLL UP as the cursor moves down.

Continue moving the cursor down as far as it will go. You'll hear a tone when the cursor can go no further.

EXTENDED MENU OF AFC SETUPS

S.Scan.ABC
S.Scan.ETA
T.Assisted
T.Unicorn
T.KingMini
T.Morse
T.Scan.ABC
T.Scan.ETA
Scan Large
RedefMorse
T.Redefind
Sw Input
Up Down
Up Down 20
Rotating >

6. Use the UP-ARROW or LEFT-ARROW key to begin moving the cursor back up. Look for the words UP DOWN or UP DOWN 20 on the left side of the screen.

Move the cursor to UP DOWN. (Or, if you are interested in large-letter scanning, move the cursor to UP DOWN 20.)

Press RETURN.

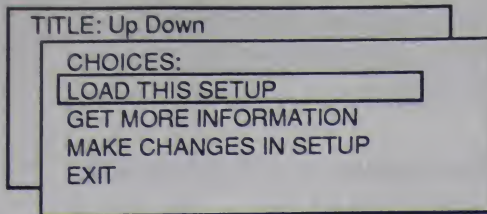
EXTENDED MENU OF AFC SETUPS

.....
Up Down
.....
.....

TITLE: Up Down
METHOD: scanning
FOR: Alex the Rabbit
Press switch #1 to select:
UP DOWN LEFT RIGHT

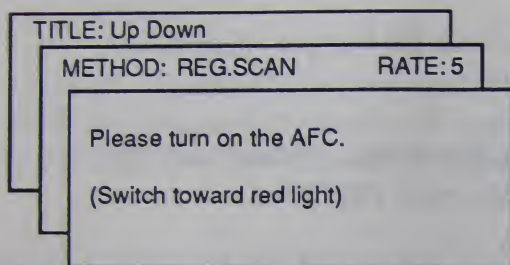
7. A block of information, called a WINDOW, will appear on the screen. The window contains a description of the UP DOWN setup.

Read the description, then press RETURN.



8. A second window will appear, offering you several choices. The cursor will be on the words **LOAD THIS SETUP**. That is what we want to do (load the setup), so **press RETURN**.

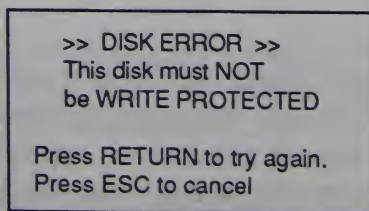
- ☛ The drive light will go on briefly, while the computer looks on the disk for information about this setup and **LOADS** (copies) the information onto the Adaptive Firmware Card, inside your computer.



9. Two new windows will appear. The middle window tells you the method and rate for this setup. (You'll learn about that in Chapter 2.) The front window asks you to turn on the AFC.

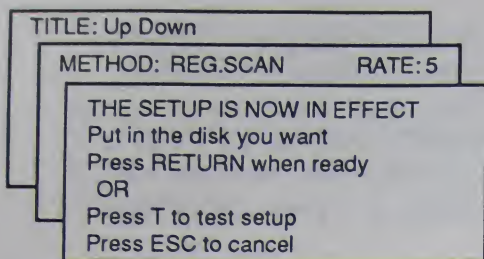
Turn on the AFC (flip the toggle toward the red light).

TROUBLESHOOTING HINT: If your Menu disk is write-protected, you will get a **DISK ERROR** message when you try to load a setup:



- ☛ To remedy this, take out the disk and remove the write protection, as described in the Troubleshooting Hint for step 3.

Put the disk back in the drive, and press **RETURN**. You should now see the windows shown for step 9.



10. The front window will tell you
THE SETUP IS NOW IN EFFECT.

Put in the application disk you want to use — for this demo, take out the Menu Disk and put the Sample Application Software disk in Drive 1.

Press RETURN.

The new disk will boot, and the menu from the Sample Application Software disk will appear on the screen.

11. **Select ALEX THE RABBIT from the menu.** (Make sure the cursor is on ALEX THE RABBIT, then press RETURN.)
12. **Press RETURN to start the Alex program.**
13. **Use the ARROW a few times from the computer keyboard.**
This will let you see that Alex is working as it should — the AFC does not change the application program.

USING THE AFC

Now let's use the Adaptive Firmware Card! What we're going to use in this demo is an input method called *scanning*. What you will do (don't do it yet) is use a switch (or the OPEN-APPLE key) to make words appear at the bottom of the screen. A cursor will move across the words, then you'll press the switch again when the cursor is on the word you want. Instructions follow.

14. **Press and hold down switch #1 (or the OPEN-APPLE key).** As soon as you press the switch, you will see the words **UP DOWN LEFT RIGHT** appear at the bottom of the screen.
15. **Release the switch.** When you release the switch, a cursor will begin moving across the words.

16. **When the cursor is on the word LEFT, press the switch again.** You will see Alex move (or try to move) to the left, just as if you had pressed the LEFT-ARROW key.
17. Decide which way you want Alex to go next — up, down, left, or right. **Press the switch again.** The line of words will reappear. **When the cursor is on the word you want, press the switch again.** Alex will move in the direction you selected, just as if you had pressed the appropriate ARROW key!
18. **Continue to use the switch in this way to move Alex to the carrot.**

You have just shown that you can run the program, Alex the Rabbit, without using the computer keyboard. (If you were using the OPEN-APPLE key, remember that this is the same as a switch plugged into the AFC I/O box.)

How Did That Work?

In the first part of the demo, you turned off the AFC and used Alex the Rabbit through the keyboard — you pressed one of the ARROW keys to move Alex in the direction you wanted. This is the way the program is normally used. Using a switch or the OPEN-APPLE key is not an option — when you tried this, Alex did not respond.

In the second part of the demo, you *were* able to use a switch (or the OPEN-APPLE key) to run Alex. **You were able to do this because you were using the Adaptive Firmware Card.**

When you pressed the switch, the Adaptive Firmware Card caused the words
UP DOWN LEFT RIGHT to appear at the bottom of the screen. (Those words certainly weren't there when you first used Alex.) When you released the switch, the AFC moved the cursor across the words. When you selected a word, the AFC sent a message to the computer corresponding to the appropriate ARROW key. The computer, thinking someone had pressed an ARROW key, moved Alex in the appropriate direction.

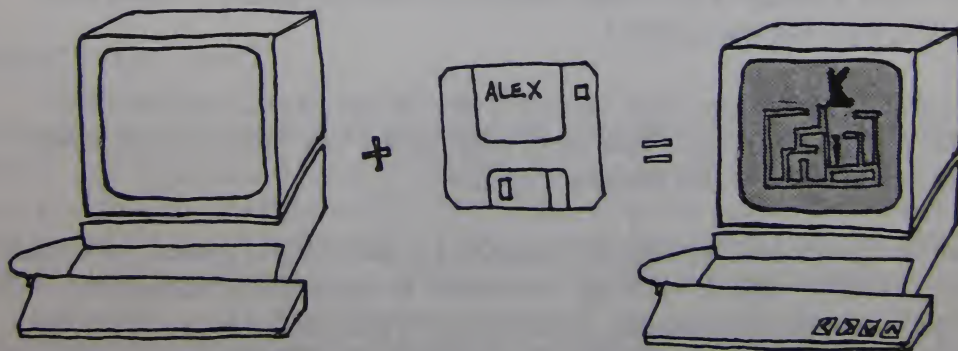
This demo illustrates the function of the Adaptive Firmware Card: the AFC allows you to adapt keyboard-input programs for use through alternate inputs. To use a bit of jargon, the AFC is a **KEYBOARD EMULATOR** — it

tricks the computer into thinking you are using the computer keyboard, when you are actually using a switch or some other device instead!

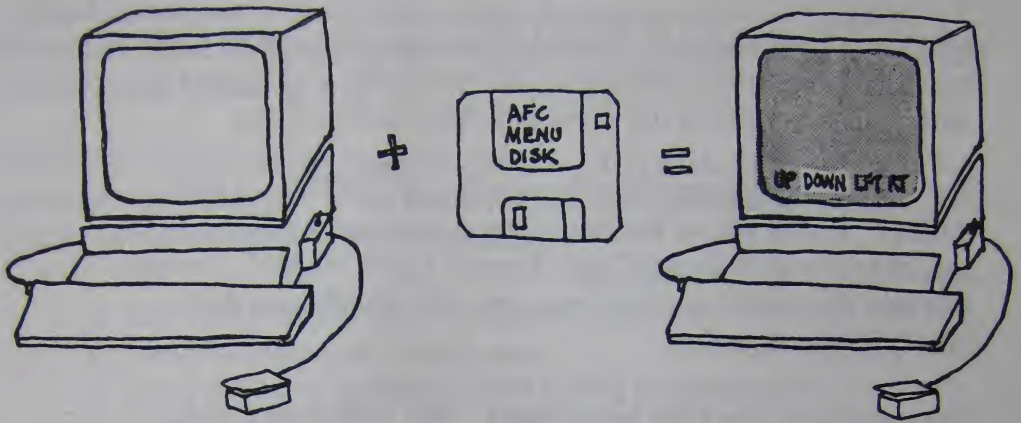
Another way of saying this is that the AFC plus your special-input device form an ALTERNATE KEYBOARD. One of the most important features of the AFC is its great flexibility. Just as your computer is not really dedicated to any one application but can become a typewriter or a calculator or a video game, depending on what application program you load into it, the AFC plus your input device can become any of a variety of specialized alternate keyboards, depending on the *setup* you load onto it.

Put another way, different setups on the AFC Menu and Construction Disk can "transform" the AFC plus an input device into a wide variety of different alternate keyboards. The way a setup transforms the AFC is similar to the way an application program transforms the computer.

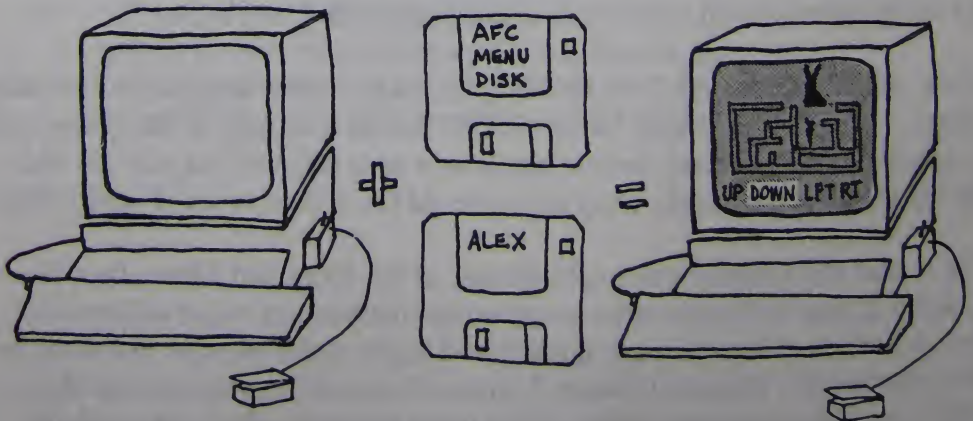
For example, when you loaded the application program, Alex the Rabbit, it turned the computer into a maze-like game. You operated this game by means of the four ARROW keys.



When you loaded the Up Down setup, this turned your AFC plus switch (or OPEN-APPLE key) into a scanning device. You were able to scan the four words UP DOWN LEFT RIGHT by means of the switch.



Whenever you use the AFC to run an application program, you will first load an AFC setup (to tell the AFC what to do), then load your application program (to tell the Apple what to do). For example, to turn your switch and the AFC into a scanning device for Alex the Rabbit, you loaded the Up Down setup (for your AFC), then you loaded Alex the Rabbit (for the Apple).



Other AFC setups for Alex the Rabbit could let you:

- Use a large keyboard with the words UP DOWN LEFT RIGHT or with four large arrows. When you touch a word or arrow on the large keyboard, Alex moves.
- Use a redefined Apple keyboard: when you press a letter in the top row of the Apple keyboard, Alex moves up; if you press a letter on the bottom of the keyboard, Alex moves down.
- Use a scanning system where the words UP DOWN LEFT RIGHT appear on the bottom of the screen, and you hear a speech synthesizer saying "Up? Down? Left? Right?" — when you hear the word you want, you press the switch, and Alex moves in that direction.
- Use a scanning line with large letters. This works only with application programs that use full-screen graphics, such as Alex.

All of these variations, and others, are possible, depending on the setups you use, and will be explained in this manual.

Optional: for a quick demonstration of large-letter scanning, go back to page 4 and repeat this demo using the setup titled UP DOWN 20. If you have an Echo speech synthesizer, the UP DOWN 20 setup will provide not only large letters but speech (a talking scanner) as well. (More information about AFC speech feedback and using other speech synthesizers will be provided in Chapter 3.)

When you booted the AFC Menu Disk, you saw a fairly long list of available setups. Using this Extended Menu of AFC Setups is as easy as using any menu — just select a setup from the list and load it onto the AFC, as you did with the Up Down setup. Each setup gives the AFC a different set of instructions.

The rest of this chapter will explore more of the Extended Menu, then in Chapter 2, you will learn more about setups themselves, what information they contain, and how you can quickly and easily make changes in a setup to suit your needs. Then, in Chapter 3, you will use other setups on the Menu Disk to explore a greater variety of the input methods which are available with the Adaptive Firmware Card. You may leave the computer ON, if you wish, because you will be using it in the next part of this chapter.

EXPLORING THE EXTENDED MENU

The AFC Extended Menu is different from other menus you may have used with your computer. The Extended Menu does not contain programs that you select and run — it contains *setups* you load onto your Adaptive Firmware Card to allow you to run application programs through various special-input methods.

The basic function of the Extended Menu is to provide you with setups for particular applications. What you did when you selected the UP DOWN setup from the Extended Menu was this:

1. Boot the Menu Disk.
2. Find the setup you want to use.
3. Load the setup (press RETURN a total of three times).
4. Turn ON the AFC.
5. Put in the application disk you want to use.
6. Load the application by pressing RETURN.

As you did this, you probably became aware of a number of choices you were skipping. Let's go back now and begin exploring more of the Extended Menu. (For additional information regarding the Extended Menu, see Chapters 6-7.)

To begin this tutorial, boot the AFC Menu Disk.

1. Place the AFC Menu Disk in Drive 1.
2. Turn the AFC OFF (flip the toggle away from the red light).
3. Turn the computer ON, or, if it is already ON, hold down CONTROL and OPEN-APPLE, while you press and release the RESET key.

When the drive light goes off, you will see the Extended Menu of AFC Setups, similar to the one shown below.

EXTENDED MENU OF AFC SETUPS		
Press '?' for help		
TITLE	INPUT	DESCRIPTION
Normal		Multi-user setting
.....	
S.Assisted	asst	any program
S.Unicorn	Unic	any program
S.KingMini	TASH	any program
S.Morse	code	any program
S.Scan.ABC	scan	any program
S.Scan.ETA	scan	any program
S.ASCII	KEI	any program
T.Assisted	asst	any program
T.Unicorn	Unic	any program
T.KingMini	TASH	any program
T.Morse	code	any program
T.Scan.ABC	scan	any program
T.Scan.ETA	scan	any program

Each horizontal line on the menu represents a setup which tells the AFC what you want it to do in a particular application. The task, as you have seen, might be to set up the AFC so you can run Alex the Rabbit with a switch, rather than the four ARROW keys.

The Extended Menu on the AFC Menu Disk has room for up to 100 setups, depending on their size. The particular setups on this Extended Menu have been created for you to use as working examples with this manual.

Other disks are also available which contain setups for the AFC. For example, Up and Running™ by Unicorn Engineering provides an Extended Menu of setups for the Unicorn Expanded Keyboard and the Adaptive Firmware Card. DLM Teaching Resources publishes a disk, Setups for the Adaptive Firmware Card, which has an Extended Menu of setups for use with their Arcademic Skill Builders in Math series. (See Appendix D.) These disks provide you with setups tailored to particular applications. They are similar to the AFC Menu Disk, because they use the Extended Menu program, but these disks do not

necessarily give you the full power and flexibility of the AFC Menu Disk, which you will be learning about in this manual.

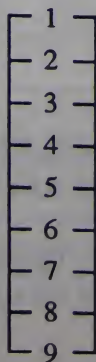
In addition to this Extended Menu of Setups, the AFC Menu Disk provides you with tools for adding your own setups to the Extended Menu. (This will be explained in Chapter 7 and in the chapter for your input method.) The first step is to get acquainted with the Extended Menu itself.

Moving Up and Down within the Menu

1. Use the **SPACEBAR**, **DOWN-ARROW**, or **RIGHT-ARROW** key to move the cursor down through the Extended Menu. When you get to the bottom of the page, the setups will **SCROLL UP** as the cursor moves down.
2. Scroll through the entire Menu to get an idea of the number of setups which are on your disk. There is plenty of room for you to add more.
3. Use the **UP-ARROW** or **LEFT-ARROW** key to move the cursor back up through the menu. Notice that the setups **SCROLL DOWN** as the cursor tries to move off the top of the page.

Using the Ruler

To help you move more quickly, the Extended Menu has an invisible ruler which divides the Menu into eight approximately equal parts. You can move the cursor to different parts of the Extended Menu by pressing a number 1-9.



- Press 1 to move to the beginning of the Extended Menu.

- Press 2 - 8 to move to other points on the Extended Menu.

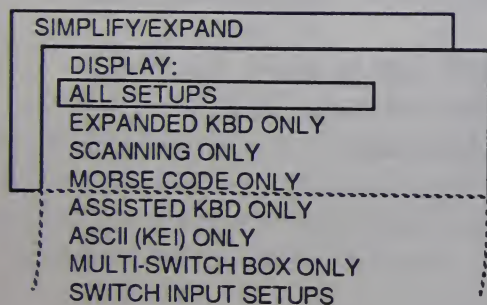
- Press 9 to move to the end of the Extended Menu.

If you delete or add setups, making the Extended Menu shorter or longer, the ruler shrinks or expands as needed, but is always divided into eight roughly equal parts, as shown above.

Simplifying/Expanding the Menu

In some situations, you may not be interested in *all* the setups available on the Extended Menu. Perhaps you are interested only in setups for a particular input method, such as scanning or expanded keyboard.

1. **Press 9 (or use SPACEBAR or ARROWS) to move to the end of the Extended Menu.**
2. **Move the cursor to the line that says SIMPLIFY/EXPAND, then press RETURN.**



A window will appear, showing various DISPLAY options. The first line is ALL SETUPS. Notice the word "more" at the bottom — this indicates there are more choices in the window than you can see at one time.

3. **Move the cursor as far down as it will go through the various display options.**

You can *simplify* the Extended Menu for any of the types of setups listed here.

4. **Move the cursor to the type of setup you want to simplify the Extended Menu for, such as SCANNING ONLY. Press RETURN.**

The disk drive will go on, making a change on the disk. The Extended Menu will reappear, but now it is simpler — it displays only the type of setups you selected in the SIMPLIFY option.

The benefit of the SIMPLIFY option is that you can quickly see all the setups for a particular input method — all other setups will temporarily disappear.

Exception: The simplify function will not make the setup in the #1 position (in this case, the "Normal" setup) disappear, even if you simplify for a different input method.

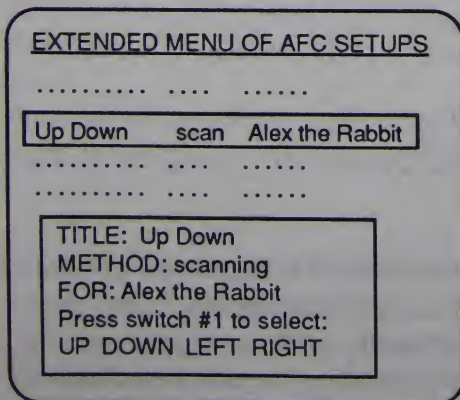
5. The other setups have *not* been deleted — you can get them all back quickly and easily: **follow steps 1-2 above, then select ALL SETUPS from the window of Display choices.** This will *expand* the Extended Menu to show all setups.

At this time, feel free to try simplifying for other types of setups. When done, be sure to bring back all setups (step 5 above) to continue this tutorial.

Zooming In on a Setup

To take a closer look at any setup, you can ZOOM IN on the setup and read a Description window.

1. Move the cursor to any setup on the Extended Menu.
2. To *zoom in* on this setup, press RETURN.



When you zoom in on a setup, a window, called the DESCRIPTION WINDOW, will appear on the screen. It contains a description of that particular setup.

If you can still see the highlighted setup on the Extended Menu, you will notice that what is displayed on the highlighted line is a reduced version of what you see in the Description window.

3. Press the ESC key to back up to the Extended Menu.

☛ The ESC key (called Escape) is the top left key on the Apple keyboard.

At this time, you may want to zoom in on other setups on the Extended Menu — just move the cursor to any setup, then press RETURN. The Description window will appear with information about that setup. After you have read the window, press ESC to return to the Extended Menu.

As you work through this tutorial, or as you experiment on your own, **feel free to explore the Menu Disk**. If you get into something that hasn't been explained yet, don't panic — just press the ESC key until you are back to the Extended Menu. Provided you are using a backup copy of the original disk, you don't even need to worry about making irreversible changes on the disk or accidentally deleting something. (The original disk is not copy-protected. You can make back-up copies by using the procedures described in the Apple manual for your System Utilities.)

The Help Window

Toward the top of your screen, on the right, it says PRESS '?' FOR HELP. **Try this.** (You don't need to use SHIFT — just touch the '?' key.) A Help window will appear, as shown below.

HELP

- ARROW keys move cursor
- Press RETURN:
 - once for a description
 - twice to make selection
- Press CTRL-I for more info.

The HELP WINDOW lets you know how to work with what you see on the screen. When you are using the Extended Menu, **you can press '?' at almost any time and get information pertinent to where you are**. The information in the Help window will vary depending on where you were when you pressed the '?'.

The particular Help window shown above tells you that you can use the ARROW keys to move the cursor and that you can press RETURN once for a description of the setup and a total of two times to select that setup. This window also says you can press CONTROL-I for more information. We'll try that next (see below).

Getting General Information

1. **Press CONTROL-I (hold down the CONTROL key and press the letter I).**

You will see a window with a menu of topics.

2. **Move the cursor down through this window.** The menu will scroll up as the cursor moves down through the topics.
3. **Press RETURN when the cursor is on a topic that interests you.** Information or instructions will appear.
4. **Press any key.** This will return you to the Select Topic window. From here, you can get information on more topics or press the ESC key to return to the Extended Menu.

When you are using the Menu Disk, the ESC key will almost always take you back (let you "escape") to the previous window or to the Extended Menu.

NOTE: You may press CONTROL-I at any time, when you are using the Extended Menu, even when there are other windows on the screen.

For a summary of the commands you have learned, see the Key Chart on the back of this page. (This chart is also available in Chapter 6.)

With this introduction to the AFC and the Extended Menu, you are now ready for a more detailed look at setups and the tools available to you with the AFC and the Menu Disk. Please proceed to Chapter 2, LEARNING MORE ABOUT SETUPS.

KEY CHART

The following keys or characters enable you to work with the Extended Menu:

SPACEBAR
DOWN ARROW
RIGHT ARROW

to move the cursor DOWN
within a menu

UP ARROW
LEFT ARROW

to move the cursor UP
within a menu

RETURN

to select the highlighted choice
OR to get further information about it

ESC

to back up or undo the last selection

1-9

to move the cursor to positions 1-9
on the Extended Menu ruler
(1 = beginning; 9 = end)

? or /

to get a Help window related to where you
are in the Extended Menu program

CONTROL-I

to bring up a general Information menu
related to the Menu Disk. Select any topic
from the menu to obtain abbreviated
instructions on that topic.

CHAPTER 2

LEARNING MORE ABOUT SETUPS

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CHAPTER 2

LEARNING MORE ABOUT SETUPS

This chapter will use a hands-on demo to introduce the parts of a setup and some of the tools for making changes or getting information about individual setups.

The concept of a *setup* will be very important in your use of alternate input methods with application programs: whenever you use the AFC to run an application program, you will first load an AFC setup (to tell the AFC what to do), then load your application program (to tell the Apple what to do). For example, in Chapter 1, you loaded the Up Down setup, then you loaded Alex the Rabbit — this enabled you to use a switch to run the Alex program.

Programs like Alex the Rabbit or AppleWorks were designed for 10-finger typists. To use such programs easily and efficiently by means of a special-input device requires (1) an input device and special-input method which is appropriate for you and (2) *a setup which tailors your device and your input method to you and your application program*. For example, suppose

- you want to use scanning, but the cursor moves too quickly or too slowly
- your input device is a switch, but scanning is difficult for you
- your input device is not a switch — it's an expanded keyboard or
- your application program requires more than the four ARROW keys

In any of these cases, the Up Down setup you explored in Chapter 1 would not be exactly right. For a setup to work well for you, you must be able to make changes in it or be able to create your own. The AFC Menu Disk not only contains ready-made setups for your use but also a variety of tools specifically designed for modifying those setups or for creating your own setups. The Menu Disk contains easy-to-use tools for constructing and modifying AFC setups. Using the tools isn't difficult, because the Menu Disk windows will guide you wherever you want to go and will assist you in using the tools.

This chapter will introduce some of the tools and concepts which are part of AFC setups and the AFC Menu and Construction Disk. (For a complete description of all of the features of the Menu and Construction Disk, see Chapters 6-7.)

RE-INITIALIZING THE AFC

A setup tells the AFC how you want to use the AFC with a particular application program. To do this, the setup draws upon fundamental resources which are contained in the AFC's operating system, or *system software*.

In Chapter 1, you booted the Menu Disk with the AFC turned OFF — this automatically *initialized* the AFC: it loaded the system software from the Menu Disk onto the card. The version of AFC system software described in this manual is SYSTEM SOFTWARE 4.0.

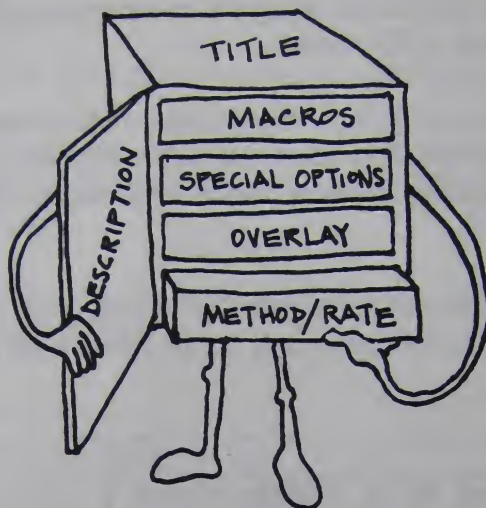
The system software stays on the card, even when you turn the computer OFF, because of the AFC memory backup system. (See page xi.) However, if the system software on the card becomes damaged or if the card "loses its memory," all you need to do to restore it is *re-initialize*: turn the AFC OFF and boot the Menu Disk.

PARTS OF A SETUP

Once the AFC has been initialized with the system software, it is ready to implement setups. You can think of a setup as a package of information, which comes in an "easy-to-load" module.

If one setup is a module, then you can think of the Extended Menu as a storeroom with shelves and shelves of these modules. When you select and load a setup, you, in effect, take one of these modules off the shelf and plug it into the AFC. The setup snaps into place, and the AFC is ready to begin its work.

Every setup contains information which is organized in specific parts. Since a visual image is often helpful, let's think of these parts as sections which are arranged in the easy-to-load module, as shown below.



Every setup can have these parts, and each part can be changed separately, to make the setup work better for you with your application program. Every setup includes a title, overlay, special options, and method/rate — the other parts are optional.

TITLE	the name of the setup, as shown on the Extended Menu
DESCRIPTION	what you see when you press RETURN to zoom in on the setup
METHOD	the AFC input method you will be using to run the computer, such as scanning, Morse code, expanded keyboard, etc.
RATE	how quickly you can manage your input method
OVERLAY	what characters you see and hear when you use your input method, and what characters the AFC sends to

the computer when you make a selection with your input device

SPECIAL OPTIONS

optional fine-tuning features which you may want to activate in particular setups, such as slowing down the application program or activating speech feedback in the AFC overlay


MACROS

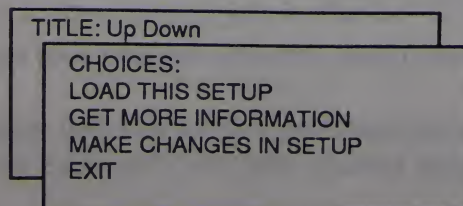
optional strings of characters or functions which can help speed up the process of using your application, including sending text or executing mouse commands.

Let's take a closer look at the parts of a setup by making some changes in the Up Down setup. To do this, we'll use a tool on the Menu Disk called the Make Changes window.

Changing Method and Rate

To make changes in a setup, you move the cursor to that setup and press RETURN two times. This brings up a list of CHOICES for that setup.

1. **Start with the Extended Menu on the screen.**
 Put the AFC Menu Disk in the drive and boot the disk. (Turn the computer on or use CONTROL-OPEN-APPLE-RESET.)
2. **Move the cursor to the UP DOWN setup, then press RETURN.** The Description window will appear.
3. **Press RETURN again.** A second window will appear, as shown below. This is the CHOICES WINDOW.



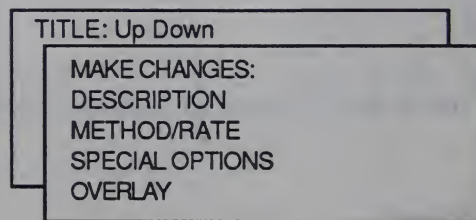
Your choices are:

- **LOAD THIS SETUP** (you did this in Chapter 1)
- **GET MORE INFORMATION** about the setup
- **MAKE CHANGES IN THIS SETUP**
- **EXIT**

Notice that the first choice is already highlighted by the cursor.

4. To make changes in the setup, use the **SPACEBAR** or **ARROW** keys to move the cursor to **MAKE CHANGES IN SETUP**, then press **RETURN**.

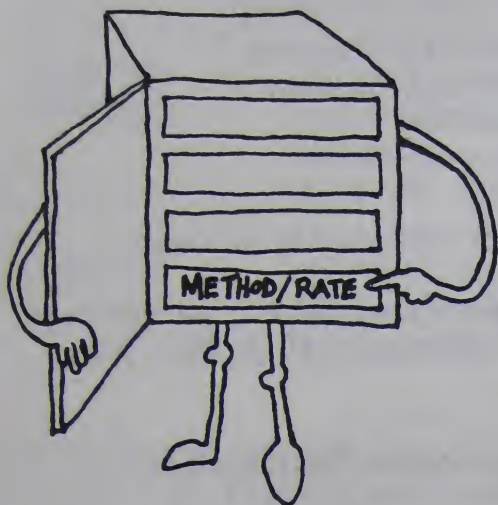
A new window will appear, as shown below. This is the **MAKE CHANGES WINDOW**.



The Make Changes window lists the parts of this setup. **MACROS** is not listed in the Up Down setup, because the Up Down setup does not include an **AFC.MACRO** character. (It's not needed for Alex the Rabbit.)

5. The foundation of a setup is its **METHOD** and **RATE**.

Move the cursor to METHOD/RATE, but don't press RETURN yet.



The AFC *method* is the alternate input method you will be using to run the application program.

The *rate* is how quickly the AFC expects you to manage the input device and method.

INPUT METHODS

The AFC allows you to use a variety of different input methods. These are:

assisted keyboard

expanded (or miniature) keyboard

Morse code

scanning

multiple switch box

normal input – including switches, paddles, Apple keyboard

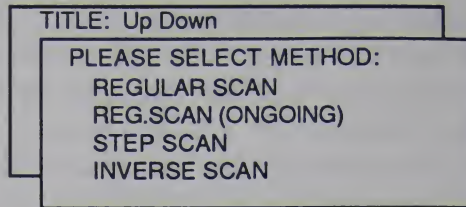
ASCII input

With some AFC input methods, VARIATIONS of the method are available. For example, there are several variations of scanning which can be used in any scanning setup.

Make sure the cursor is on METHOD/RATE, then press RETURN.

6. You will now see a caution window, warning you that "you are about to make permanent changes" in this setup. This is what we want to do, so press Y for YES.

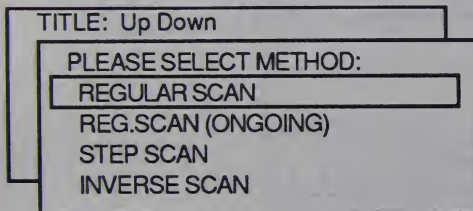
7. Now the second window will change, showing you the variations of the method this setup. This is the **METHOD SELECTION WINDOW**.



A diagram showing a window titled "Up Down" with a list of scanning methods. The list includes "REGULAR SCAN", "REG.SCAN (ONGOING)", "STEP SCAN", and "INVERSE SCAN".

```
TITLE: Up Down
PLEASE SELECT METHOD:
REGULAR SCAN
REG.SCAN (ONGOING)
STEP SCAN
INVERSE SCAN
```

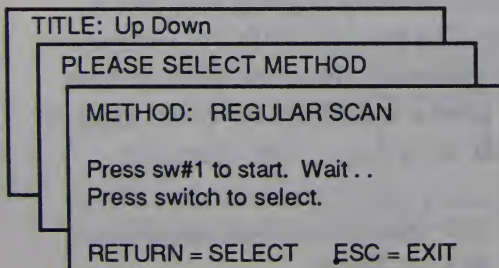
Use the **ARROW** keys to scroll through the variations in the method selection window. Go down as far as you can go, then back to the top.



A diagram showing the same window as before, but with "REGULAR SCAN" highlighted by a horizontal bar.

```
TITLE: Up Down
PLEASE SELECT METHOD:
REGULAR SCAN
REG.SCAN (ONGOING)
STEP SCAN
INVERSE SCAN
```

8. To see a description of regular scanning, move the cursor to **REGULAR SCAN** then press **RETURN**.



A diagram showing a new window titled "Up Down" with a description of the "REGULAR SCAN" method. It includes instructions to press "sw#1" to start and "switch" to select, and a note that "RETURN = SELECT" and "ESC = EXIT".

```
TITLE: Up Down
PLEASE SELECT METHOD
METHOD: REGULAR SCAN
Press sw#1 to start. Wait . .
Press switch to select.
RETURN = SELECT  ESC = EXIT
```

9. A third window will appear, describing the method.

Press ESC to back up to the method selection window.

You may, at this time, move the cursor to other methods in the method selection window, press **RETURN** to get a description, then press **ESC** to back up to the method selection window.

10. Let's change the method in this setup to step scanning.

Move the cursor to **STEP SCAN**, then press **RETURN**. The description for that method will appear. Notice the window tells you to press **RETURN** to select that method.

Press **RETURN**.

RATE

11. The third window changes. The new window says **PLEASE SET RATE**. The window tells you the present rate for the method, gives you the range of rates available, and asks you to enter the new rate.

The diagram shows three overlapping rectangular windows. The top window is partially obscured by the middle one, which is partially obscured by the bottom one. The text in the windows is as follows:

- Top window: TITLE: Up Down
- Middle window: METHOD: STEP SCAN
- Bottom window: PLEASE SET RATE:

PRESENTLY= 5
RANGE=1- 29
ENTER NEW RATE ==>

Every setup includes a **RATE** which defines how quickly you will be expected to manage the input method. The rate has different meanings for different input methods, but, **in general, the rate affects how quickly the AFC expects you to press a switch or how long it expects you to hold down a switch or a key.** For example:

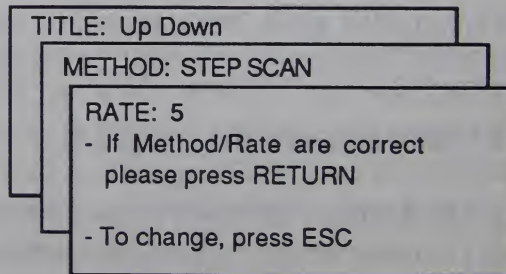
- With an expanded keyboard, the rate determines how quickly a membrane keyboard responds to your touch.
- In the two-switch Morse code methods, the rate determines how quickly you must move from one switch to another to send the code for a letter.
- In some of the scanning methods, the rate determines how quickly the cursor moves across the items and, therefore, how quickly you must press the switch to select an item. In the AFC Demo (Chapter 1), you were using regular scanning at a rate

of 5. This meant that the cursor moved from item to item at a moderate rate. If the rate had been 10, the cursor would have moved much more quickly.

Notice, on the screen, that we will be using STEP SCANNING, rather than regular scanning. Step scanning means that, rather than watching the cursor move by itself, we will be pressing the switch each time we want the cursor to move one step. In this case, the rate setting will affect how long the AFC waits, after we release the switch, before it assumes that the item under the cursor is the one we want. This will be explained more fully in the chapter titled SCANNING. For right now, we want a rate of 5.

12. Press the number 5, then press RETURN.

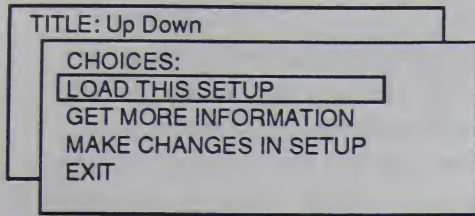
The third window will change again. This is, in essence, a confirmation window. Look at the headings on the three windows and you should see TITLE: UP DOWN; METHOD: STEP SCAN; RATE: 5.



If this is not what you see, you can press ESC and make changes. If it is correct, **press RETURN**.

- 13. The third window will change and say SAVING CHANGES TO DISK.** The red light on the disk drive will go on, indicating that these changes are being saved permanently on the disk. (Don't be alarmed — it will be very easy to change these back, later on, if you want to.)

Using a New Method



14. When the changes have been made, the screen will return you to the Choices window.

Next we want to load the setup, so we can use it. The cursor should already be on **LOAD THIS SETUP**, so all you need to do is **press RETURN**.

15. If your AFC is switched OFF, a window will prompt you to turn it ON.
16. When the **SETUP IN EFFECT** window appears, **put in the disk you want to use** (take out the Menu Disk, put in the disk with Alex), **then press RETURN**. When the menu appears, select Alex the Rabbit.
17. What you will do is run Alex again, this time with a new method, **STEP SCANNING**:

- (1) **Press RETURN to start the program.**
- (2) What you will do (don't do it yet) is use a switch (or the OPEN-APPLE key) to make words appear at the bottom of the screen — but you will use the switch differently than before. You will press the switch repeatedly, to make the cursor move one step at a time. When the cursor is on the word you want, you will release the switch and wait. Instructions follow.

Press and hold down switch #1.

When you see the words appear, start pressing and releasing the switch, as if you were counting, about one press per second.

When the cursor is on the word you want, release the switch and wait.

After a brief acceptance time (about two seconds), you will hear a beep, indicating the item has been accepted, and Alex will try to jump in that direction.

- (3) Continue to use the switch in this way to move Alex to the carrot.

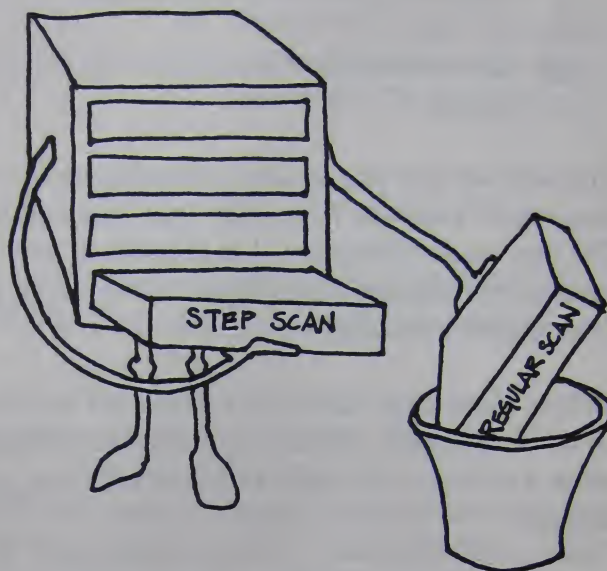
You will see that you are again running Alex with a single switch, but **the input method (the way you use the switch) is different.** The new method may feel comfortable or uncomfortable, and you may have questions regarding why a person would use step scanning rather than regular scanning.

Details about each method are discussed in the methods chapters (Part II) of this manual. What is important to remember, at this point, is that when a method isn't comfortable or efficient, you can easily make changes:

- Changing the RATE in the setup, making it faster or slower, sometimes can make the method easier to use.
- With some methods, such as scanning or Morse code, you can try other VARIATIONS of the INPUT METHOD, as we did when we changed the UP DOWN setup from regular scanning to step scanning. (Variations for AFC input methods are described briefly in Chapter 3 and in detail in Part II of this manual.)

Additional factors related to successful use of an input method and resource people who may be able to help you are discussed in the chapter titled **FACTORS AND RESOURCES.**

18. When we changed the method to step scan, the change in the setup was saved on the disk.

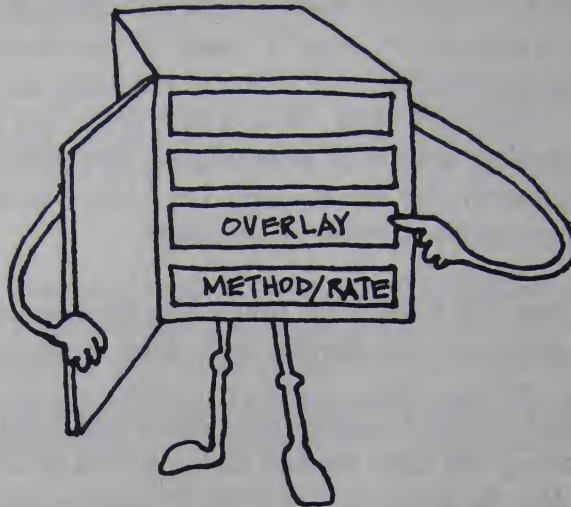


If someone else will be using the same Menu Disk after you, with this tutorial, please follow the steps below to change the method back to regular scanning.

1. Select the UP DOWN setup.
2. Select MAKE CHANGES.
3. Select METHOD/RATE.
4. Set the method to REGULAR SCAN.
5. Set the rate to 5.
6. Confirm the method/rate when prompted.

Using a New Overlay

We've said that the foundation of every setup is the AFC input method. In addition to a method, a setup must have an OVERLAY.



To help illustrate the concept of an AFC overlay, we will make use of another setup on the Menu Disk.

1. **Start with the Extended Menu on the screen.**
2. **Select the setup titled ROTATING >.**
3. **Read the description, then press RETURN.**
4. **When you get to the Choices window, select LOAD THIS SETUP.**

TITLE: Rotating >	
METHOD: REG.SCAN	RATE: 7
THE SETUP IS NOW IN EFFECT Put in the disk you want Press RETURN when ready OR Press T to test setup Press ESC to cancel	

5. **When the SETUP IN EFFECT window appears, you may go ahead and operate Alex with this new setup, as before, or, to save time, you could opt just to TEST the setup. To do this, press T.**

6. A Test Mode window will appear. This window will let you test or try out a setup before you load an application program.

Press and release the switch.

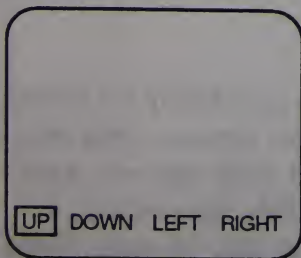
You should see a "^" symbol at the bottom left corner of the screen. This changes, in turn, to ">" then "V" then "<" and then "^" again. The changing of the symbol gives the effect of a rotating arrow.

7. **When the rotating arrow is pointing to the right, press the switch.** The cursor in the Test window (or Alex, if you are using Alex), will move (or try to move) to the right.
8. **Continue to use the switch to move the cursor in the Test window (or Alex) to up, down, left, and right, as desired.**

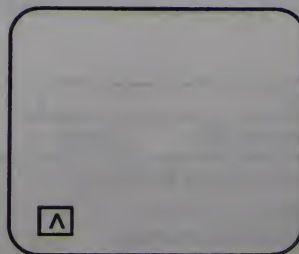
When you use the ROTATING > setup, the *method* which you use to select an item is regular scanning, the same method that you used in Chapter 1 in the UP DOWN setup. But the *selection items* are different — instead of the words UP DOWN LEFT RIGHT, you get a rotating arrow. What has changed this time is not the method but the *overlay*.

With the AFC, we use the word OVERLAY to describe how the AFC selection items are displayed (seen and heard) and how they are defined.

With the Up Down setup,
the AFC *displayed* the words
UP DOWN LEFT RIGHT.



With the Rotating > setup,
the AFC *displayed* a rotating
arrow.



In both overlays, the words or arrows were *defined* as ARROW characters — while the displays were different, what the *computer received* when you selected an item was an ARROW

character, just as if an ARROW key had been pressed on the keyboard.

Put another way, an AFC overlay includes what you see and hear when you use your input device and what the computer receives when you use the device to make a selection.

DISTINCTION BETWEEN METHOD AND OVERLAY

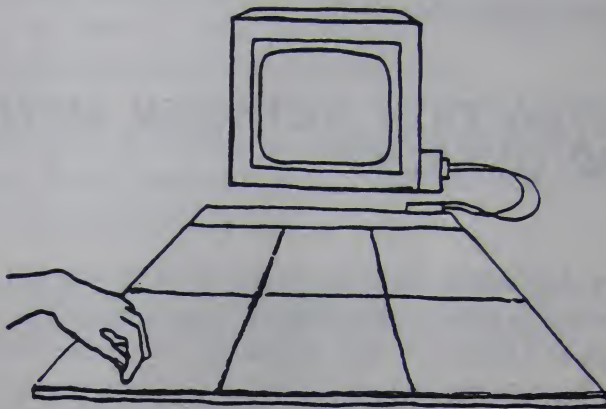
Every AFC setup contains a *method* (what you DO with the switch or keyboard to make a selection), a *rate* (how quickly you must manage the switch or keyboard), and an *overlay* (what the USER SEES and HEARS and what the COMPUTER RECEIVES.) To better understand the distinction between method and overlay, let's consider two examples on the next two pages.

EXAMPLE 1: A UNICORN KEYBOARD WITH SIX AREAS

The *method* is what the user does to send characters to the computer: pressing a square on the expanded keyboard.

METHOD

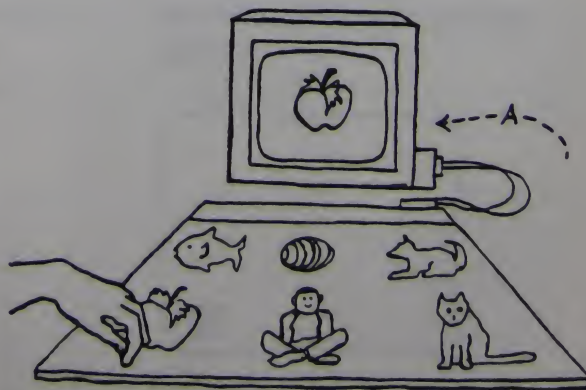
what the user does
to send characters
to the computer



The paper overlay shows six pictures – Apple, Boy, Cat, Dog, etc. When you press one of these pictures, the computer receives A or B or C or D, etc. The *AFC overlay* is what the user sees + what the computer receives: the pictures plus the specific letters the AFC sends to the computer when a picture is pressed.

OVERLAY

what the user sees
and what the
computer
receives

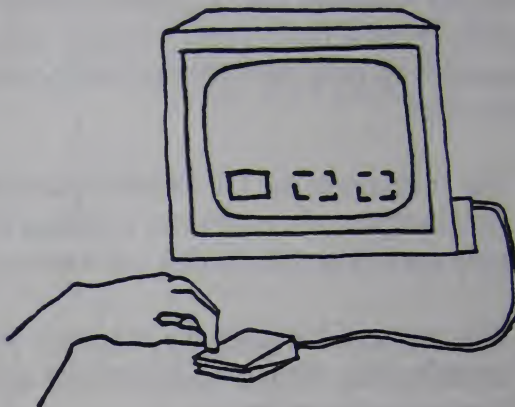


EXAMPLE 2: A SCANNING LINE WITH THREE CHOICES

The *method* is what the user does to send characters to the computer: in regular scanning, for example, you press a switch to make the scanning items appear, then press the switch again when the cursor is on the item you want.

METHOD

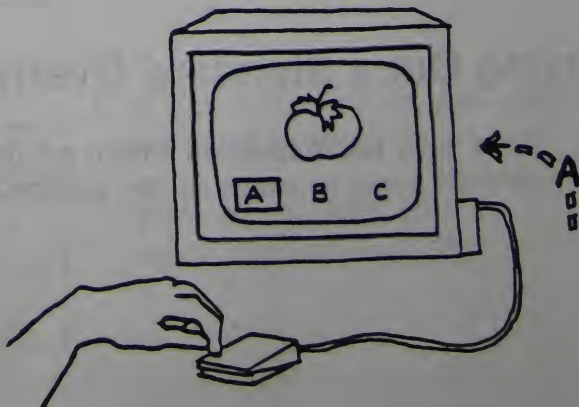
what the user does
to send characters
to the computer



The scanning line shows the letters A B C, or it could show the words APPLE BOY CAT. When you select one of these items, the computer receives A or B or C. If this is a talking overlay, you will also hear the words spoken by a speech synthesizer as the cursor moves across the screen. The *overlay* is what the user sees (the words on the scanning line) and hears (if spoken by the speech synthesizer) plus what the computer receives (the specific letters) when an item is selected.

OVERLAY

what the user sees
and what the
computer
receives



TYPES OF AFC OVERLAYS

AFC overlays can be standard or customized/redefined.

- **CUSTOMIZED/REDEFINED** overlays are ones that are specially created for a given person or application. A customized/redefined overlay may or may not contain all the keyboard characters. It only needs to contain the characters needed for a specific application.

The overlays in the UP DOWN and the ROTATING > setups are examples of customized scanning overlays — each contains only the characters needed for Alex the Rabbit.

The example of a Unicorn keyboard with six areas and a scanning line with three choices are also examples of customized overlays.

- **STANDARD** overlays, on the other hand, are ready-made AFC overlays which contain all the characters and functions on the Apple keyboard, arranged in a standard manner for general-purpose use. Standard overlays for all methods are available in the setups beginning with "S." (for Standard) and "T." (for Talking standard) on your Extended Menu.

To demonstrate the general-purpose, full-keyboard nature of a standard overlay, let's use a standard overlay with scanning.

Trying Out a Standard Overlay

1. **Start with the Extended Menu on the screen. Press 1 (or use ARROW keys) to move to the beginning of the Menu.**

EXTENDED MENU OF AFC SETUPS

Normal

.....

S.Assisted

S.Unicorn

S.KingMini

S.Morse

S.Scan.ABC

S.Scan.ETA

S.ASCII

T.Assisted

T.Unicorn

T.KingMini

T.Morse

T.Scan.ABC

T.Scan.ETA

2. Notice the first setups begin with "S", followed by setups beginning with "T." Each "S" setup contains a Standard overlay, and each "T" setup contains a Talking standard overlay.

Move the cursor to the S.SCAN.ABC setup; press RETURN.

TITLE: S.Scan.ABC
METHOD: scanning
FOR: any program
Can be set to any scanning method. Includes arrays for all keys on Apple keyboard.

3. A Description window appears. Notice that this setup includes "all keys on Apple keyboard."

Press RETURN.

TITLE: S.Scan.ABC

CHOICES:

LOAD THIS SETUP

GET MORE INFORMATION

MAKE CHANGES IN SETUP

EXIT

4. The Choices window will appear with the cursor on LOAD THIS SETUP.

Press RETURN.

TITLE: S.Scan.ABC

METHOD: REG.SCAN

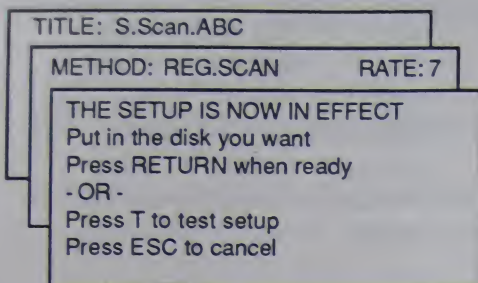
RATE: 7

Please turn on the AFC.

(Switch toward red light)

5. If your AFC is not on, you will be prompted to turn it on.

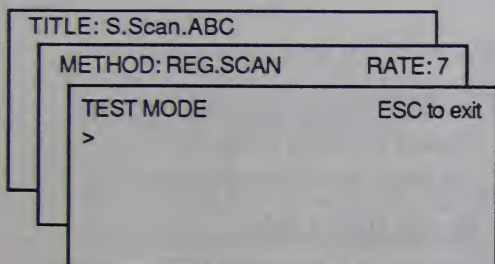
Turn on the AFC (flip the toggle toward the red light).



6. You will see a window telling you **THE SETUP IS NOW IN EFFECT**.

To use application software, you would put in the application disk and press RETURN. In this demo, however, we will just sample or "test" the setup.

Press the letter T — to Test the setup.



7. A Test Mode window will appear. This window allows you to try out the setup without using application software.

8. **Press switch #1** (or the OPEN-APPLE key) **and hold it down**. A line with the full alphabet will appear at the bottom of the screen. The letters are arranged in groups.

R<#. + ABCDE\ FGHIJ= KLMNO PQRST UVWXY Z.^*

9. **Release the switch** — the cursor will begin moving across the groups.
10. **Use the switch to select a letter:**

- (1) **Decide on a letter you'd like to print.**
- (2) **Locate the letter in the scanning line.** (If the line has disappeared, press the switch again and hold it down while you locate the letter. When you have found the letter, release the switch.)
- (3) **When the cursor reaches the group with your letter, press and release the switch.**

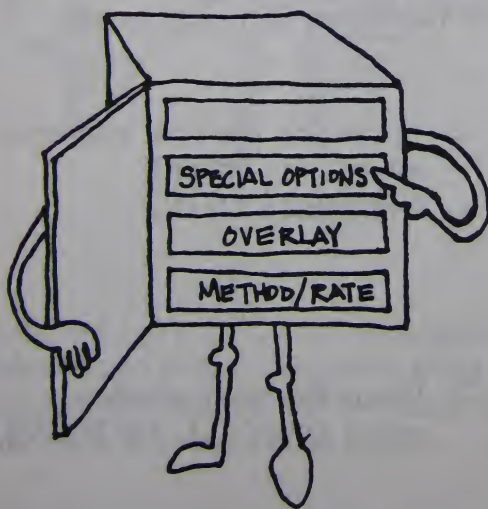
- (4) When the cursor reaches the letter you want within the group, **press the switch again.**

The letter you selected will appear in the test window.

11. This gives you a quick idea of how a standard overlay is different from a customized overlay. A standard overlay provides access to all Apple keyboard characters, with the characters arranged in a standard manner for general-purpose use. How to use the standard overlay for each method is treated in detail in the method chapters (eg, for a tutorial on the standard scanning overlays, see the chapter titled SCANNING).
12. Press ESC four times to return to the Extended Menu.

A QUICK LOOK AT SPECIAL OPTIONS

In addition to method/rate and overlay, every AFC setup has a part called SPECIAL OPTIONS.



This part of the setup includes a small or large number of optional features for fine tuning the AFC for use with particular software application programs. The exact special options in a setup will vary, because some options apply only to certain input methods or to setups with certain characters in the overlay.

Examples of special options include:

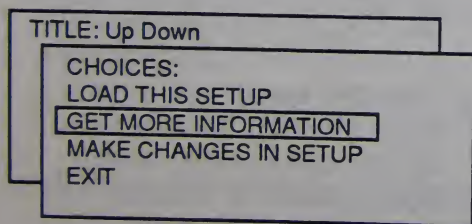
- SLOWDOWN Allows you to slow down any interactive application program.

- **SCAN SIZE** Allows you to enlarge the size of a scanning array to 20-column size (approximately 1/2 inch), provided the application program uses full-screen graphics.
- **AFC.SPEECH** Allows the expanded keyboard, assisted keyboard, scanner, or Morse code to "talk" — so the user gets speech feedback from using the AFC overlay. (A speech synthesizer is required).

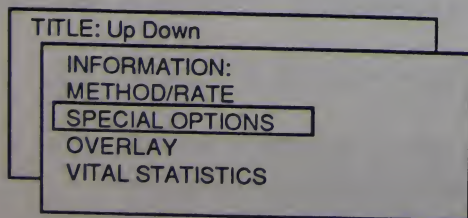
SPEECH FEEDBACK will be discussed in Chapter 3. SLOWDOWN, SCAN SIZE, and other special options will be discussed in Chapter 5. For now, just keep in mind that special options are fine-tuning features which you may want to activate in some AFC setups.

If you would like, at this time, to view what special options are available in certain setups and to get a brief description of each, you can use yet another tool on the Menu Disk — the Get More Information window, available for each setup.

1. **Select any setup. Press RETURN two times to bring up the Choices window.**



2. **From the Choices window, select GET MORE INFORMATION.**



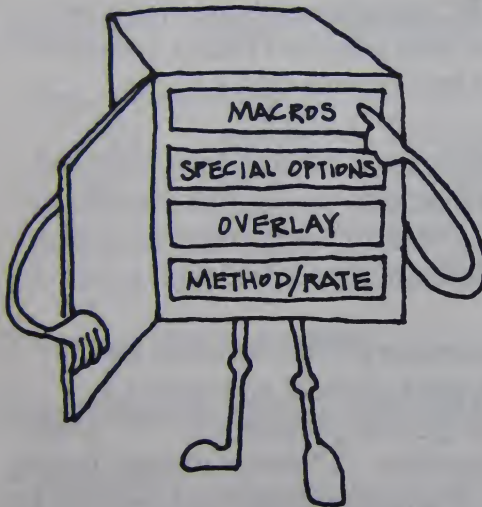
3. **From the next window, select SPECIAL OPTIONS.**

4. **Scroll through the options listed.**

Remember that these are only the options that apply to this particular setup. (A complete list of all special options will be given in Chapter 5.)

5. When the cursor is on an option you're interested in, press RETURN for a description, then press ESC to back up.
6. Use ESC to back up to the Choices window or to the Extended Menu.

MACROS



MACROS for text or mouse commands are an enhancements which will be described in Chapters 17-18 of this manual. They will be useful for two groups of people: people who use an AFC input method for independent, full-keyboard access and people who create setups for AFC users.

If you are a new AFC user, we suggest you become familiar with AFC methods and overlays before working with AFC macros. If you are already experienced with your AFC method and overlay, feel free to read about macros in Chapters 17 and 18.

The back of this page contains a summary of the parts of an AFC setup.

With this introduction to AFC setups and the Menu Disk, you are now ready to begin exploring some of the available methods and overlays. This will help you decide which method and what type of overlay will be most useful for you. Please proceed to Chapter 3, EXPLORING AVAILABLE METHODS AND OVERLAYS.

SUMMARY OF THE PARTS OF AN AFC SETUP

TITLE	the name of the setup, as shown on the Extended Menu
DESCRIPTION	what you see when you press RETURN to zoom in on the setup
METHOD	the AFC input method you will be using to run the computer, such as scanning, Morse code, expanded keyboard, etc. — specifically, what it requires you to <i>do</i> to send characters to the computer
RATE	how quickly the AFC expects you to use your input device, such as how soon you must press a switch or how long you must hold down a switch or key
OVERLAY	<p>how the AFC selection items are displayed (seen and heard) and how they are defined — what you SEE and HEAR <i>and</i> what the COMPUTER RECEIVES when you use your input device to make a selection</p> <p><i>Standard</i> overlays contain all the characters and functions on the Apple keyboard, arranged in a standard manner for general-purpose use. "S" setups contain Standard overlays. "T" setups contain Talking standard overlays. <i>Customized/redefined</i> overlays are specially created for a given person or application. — they may or may not contain all the characters on the Apple keyboard.</p>
SPECIAL OPTIONS	optional fine-tuning features which you may want to activate in particular setups, such as slowing down the application program or activating speech feedback in the AFC overlay
MACROS	optional strings of characters or functions which can help speed up the process of using your application, including sending text or executing mouse commands.

CHAPTER 3

EXPLORING AVAILABLE METHODS AND OVERLAYS

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CHAPTER 3

EXPLORING AVAILABLE METHODS AND OVERLAYS

This chapter will give you a summary of each input method available with the Adaptive Firmware Card and the opportunity to use these methods with pre-existing setups. Complete information on each method is provided in Part II of this manual.

As mentioned in Chapter 2, the AFC input methods include:

- assisted keyboard**
- expanded (or miniature) keyboard**
- Morse code**
- scanning**
- multiple switch box**
- normal input**
- ASCII input**

The fact that the AFC has such a wide variety of input methods can be confusing — you may not be sure which one to try first, or you could spend considerable time learning one, only to find out later that another method might have been easier or more efficient for you! We recommend that you read through this chapter completely and that you try out various methods before you focus in detail on a particular method.

If you are in a hurry, and if you already know which AFC method you want to use, you may decide to read only about that method. We recommend, however, that at some point, you return to this chapter to sample the other methods — you may find other AFC methods which will be useful to you, as well as the one you originally wanted.

The first part of this chapter will introduce several programs on the Sample Application Software Disk and will provide basic information on AFC speech feedback. The sample application programs include Alex the Rabbit,

Text Demo, Lemonade Stand, TAG Sampler, and Shapes Dragon. You are, of course, welcome to use your own application software, if you prefer.

The second part of the chapter is divided into sections for each basic method. Each section highlights **who** the method was designed for, the **advantages** of the method, the function of the **rate** setting, the **input devices** required, and **what the method does**. More information on the method is then presented, followed by suggestions for trying out the method with example setups on your AFC Menu Disk. Demos are available at the end of the chapter, if needed.

If you haven't already read Chapters 1-2, you should do so now, as the concepts and terminology presented there will be helpful here.

To try out the input methods, you will need:

- The Adaptive Firmware Card, already installed
- Your copy of the AFC Menu Disk
- The Sample Application Software disk or your own application software
- Speech synthesizer, installed (optional)
- Your own input devices, such as switches or an expanded keyboard. The COMMAND/OPEN-APPLE and OPTION/SOLID-APPLE keys may be used in place of switches, if you prefer.

***** CAUTION — make sure the computer is OFF when connecting or disconnecting switches or cables to the AFC I/O box. *****

USING THE APPLICATION SOFTWARE

The first step in exploring available methods and overlays is to practice using the application software which you will use when you try out the methods. If you have application software of your own which you wish to use, please become familiar with the software prior to using it with an alternate input method. Brief descriptions of the software on your Sample Application Disk follow.

Alex the Rabbit

Alex the Rabbit, which you used in Chapter 1, is an example of a program which require only a few keys as input — in this case, the four ARROW keys.

Text Demo Program

The Text Demo Program is a simple text-writing program — it is a good one to sample if you are planning to use the AFC with a word processor or with a spelling drill program. It has two modes: Simple Text, which merely displays what's typed on the keyboard, and Target Word, which allows the user to practice writing a specific word (and ignores mistakes). Use CONTROL-S to switch between Simple Text and Target Word modes.

*Use the LEFT-ARROW key, not the DELETE key, to backspace.
The DELETE key and the TAB key have no effect in this
program.*

Lemonade Stand

Lemonade Stand, by Apple Computer, is an educational program which requires use of a limited number of computer keys (the numbers plus RETURN, Y, N, SPACEBAR, and ESC). Directions for using the program will appear on the screen.

TAG Sampler

TAG (Talking Animated Graphics), by Pyramus Software, is a cause-and-effect program, where pressing a certain letter key produces a particular animated graphic. If you have an Echo Speech Synthesizer in your computer, speech synthesis is also provided. The TAG Sampler on the Sample Application Software Disk makes use of two keys: T and G. The complete TAG program, has more than 25 such graphics, developed for use with severely retarded and autistic children. (See Appendix D.)

Shapes Dragon

Shapes Dragon is a special-needs program designed to be run with a single switch or game button. If you had a special switch, you would attach it to the computer in some way that connects to the Apple's Game I/O port. (You would not *have* to have an Adaptive Firmware Card, but you can use the AFC as a switch interface for this type of program.)

If you have a game button you wish to use, such as the button on a joystick or paddle, be sure to connect it while the computer is OFF. You may use the OPEN-APPLE key as a game button, if you prefer. Unlike the other sample application programs, Shapes Dragon does not operate by keyboard input — it is a *switch-input* program with its own special-input method (scanning).

Once you have loaded Shapes Dragon, the screen will ask you to ENTER RATE OF SCAN. This program makes use of a large arrow which moves (scans) down a column of shapes. The RATE OF SCAN determines how fast the arrow moves through the choices. We suggest trying a rate of 5.

Close relations of this dragon (A*B*C*Dragon and Word Burner) are available on a disk called Motor Training Games (see Appendix D).

USING AFC SPEECH FEEDBACK

Each AFC input method has the option for speech feedback. This does not add speech to your application program — it adds speech only to the AFC overlay. When you read the summaries in the rest of this chapter and try out some of the setups on your Extended Menu, you may want to try out the speech option as well. For speech feedback to work:

- (1) The overlay in the setup must have been created to include speech feedback.
- (2) The Menu Disk must be configured for your type of synthesizer.
- (3) The special option of AFC.SPEECH must be ON in that setup. For best results, the speech feedback in that setup should have been written for the same type of synthesizer that you are using.

Speech Synthesizers

Two types of speech synthesizers can be used with AFC speech feedback:

- Any EXTERNAL speech system which connects to the Apple IIGS computer by means of the serial port or a serial interface card. The speech system itself is outside the computer. Examples are the Type 'N Talk and the Personal Speech Synthesizer by Votrax, Inc. and the DECtalk by Digital Equipment Corporation.

OR

- An Echo II, Echo +, or Echo IIb Speech Synthesizer by Street Electronics. The Echo is a printed circuit board which fits in a slot inside your computer — you do not need to connect it to a serial port or card.

SETTING UP AN EXTERNAL SPEECH SYNTHESIZER

You should set up and test the system (steps 1-3) *before* you involve the AFC at all!

1. Connect the synthesizer to the computer.

You need to either obtain the correct cable to connect the synthesizer to one of the Apple IIGS' built-in serial ports (either the printer port or the modem port) *or* install an interface card, such as the Super Serial card (by Apple), and connect the card to the synthesizer with an appropriate cable.

2. Configure the computer and synthesizer system.

- If you are using an **interface card**, use the Apple IIGS control panel to set the slot number for your interface card to 'Your Card.' In addition, you may need to set dip switches on the interface card to match the Baud rate, handshaking, and other requirements of your speech synthesizer. You will need to refer to the manuals of both the synthesizer and the interface card to do this.
- If you are using a **built-in port** on the Apple IIGS, there are two parts of the Apple IIGS control panel to watch: "**Slots**" should show the slot you are using as "modem port" or "printer port" — do *not* change the setting to "your card." The "**port**" you are using must have settings which correspond to your speech synthesizer, as described below.

If you are using the built-in **modem port**, and if you set the synthesizer to handle 1200 Baud, the default settings in the Apple IIGS control panel should work fine. (If you set your synthesizer to handle a different Baud rate, you must change the settings in the Apple IIGS "modem port" to match that Baud rate.)

If you are using the built-in **printer port**, the default rate is 9600 Baud and the default "device connected" is "printer." You need to select "printer port" on the control panel and change "device connected" to "modem." You also need to adjust the Baud rate in the Apple IIGS "printer port" and/or in your synthesizer, so that they are the same.

3. Test the system.

Turn the synthesizer and the computer ON. Press CONTROL-RESET to stop the disk drive.

Type PR# (then the number of the slot your synthesizer is in); press RETURN.

Type some letters and see if the synthesizer works correctly. If it does not, review steps 1-2. Do not go to step 4, until you have the system working.

4. **Activate the speech options in your AFC setup.** Go ahead to "Activating the AFC Speech Options," further down on this page.
-

SETTING UP AN ECHO SPEECH SYNTHESIZER

1. **Install the Echo in the computer.** Follow the instructions in your Echo manual for installing the Echo speech synthesizer. Be sure you know how to adjust the volume.
 2. **Activate the speech options in your AFC setup,** as described below.
-

Checking or Changing the Disk Configuration

1. Boot the Menu Disk. Press '9' (or use ARROWS or SPACEBAR) to move to the bottom of the Extended Menu. **Select OTHER OPTIONS.**
2. **Select CHANGE SPEECH.** The screen will show the disk is presently configured for a certain type of synthesizer (and, for external synthesizers, a certain slot number).
3. **To change this, press Y.** A "Speech Configuration" page will appear — **select the type of speech synthesizer** you will be using.

If you select "external synthesizer," the program will ask you to specify the location (slot number) for your synthesizer.

Note: AFC speech feedback will usually work well only with the type of synthesizer the setup was originally written for. If you reconfigure the disk for a different type of synthesizer, you will probably need to edit the speech in that overlay. The "T" setups are an exception — they were written to be used with either an Echo *or* an external synthesizer.

Activating the Speech Option

1. **Highlight the setup you want to use.**
2. **Press RETURN two times to bring up the Choices window.**
3. **From the Choices window, select MAKE CHANGES.**
4. **From the Make Changes window, select SPECIAL OPTIONS.**
Respond Y to the caution window.
5. **When the list of special options appears, move the cursor down until you find the option called AFC.SPEECH.**

If AFC.SPEECH is not listed, this overlay does not include speech feedback.

If AFC.SPEECH is OFF, press RETURN two times and enter a setting of 1 to turn it ON. If AFC.SPEECH is ON, continue reading.

6. **Press ESC to return to the Choices window. Select LOAD THIS SETUP.** As a test, press T to bring up the Test window, then use your input device. You should get speech feedback from your synthesizer when you use the AFC overlay.

If the test works correctly, press ESC to exit test mode, then put in your application disk. Press RETURN and try the setup with your program.

To de-activate speech feedback in a setup, use Make Changes ... Special Options to change AFC.SPEECH to OFF.

Looking for a Setup with a Talking Overlay

The quickest way to find out if a setup includes speech feedback in the overlay is to use GET MORE INFORMATION ... VITAL STATISTICS.

1. **Boot the Menu Disk. Highlight the setup.**
2. **Press RETURN two times to bring up the Choices window.**
3. **Select GET MORE INFORMATION, then select VITAL STATISTICS.**
In the Vital Statistics window, the "speech feedback" line will say YES if speech feedback is on, OFF if speech feedback is off, and NO if the overlay does *not* include speech feedback — in this case, you'll need to look for another setup or create your own which includes speech.

ORDER OF PRESENTATION

The AFC includes a wide variety of input methods. In earlier versions of the AFC, these were identified by a *method number*, such as methods 2-7 for different kinds of scanning, method 0 for the expanded keyboard, etc. In System Software 4.0, the method numbers have been dropped: all methods are identified by name only. In describing these different methods, a natural question becomes which methods to describe first and which to describe last.

In this manual, we have chosen to present the AFC input methods in a *roughly hierarchical* fashion, in terms of the motor dexterity required:

- assisted Apple keyboard
- expanded or miniature keyboard
- Morse code
- scanning
- ASCII input
- multiple switch box
- normal input

This is not a strict ordering, but, in general, a person who can *comfortably and efficiently* use the Apple keyboard or an expanded or miniature keyboard would prefer this to scanning. In general, Morse code requires more dexterity than scanning, but it can be much more efficient than scanning. Normal input (for switch-input software) and multiple switch box input are placed last, since these are most likely to be used in motor training or recreation, rather than for full-keyboard access. ASCII-input is placed above these, because, like the methods grouped above it, it provides full-keyboard access. (The motor dexterity required for ASCII input depends on the input method used with the ASCII communication device.)

We must urge, however, that this rough hierarchical ordering not be taken literally. Some people who can use both the assisted keyboard method and scanning prefer scanning, since it allows uninterrupted eye contact with the screen. Others who use can use both the assisted keyboard and Morse code prefer Morse code, because they find it quicker and less fatiguing.

With this introduction, we invite you to use the next pages to explore the various special-input methods offered by the AFC.

THE ASSISTED IIGS KEYBOARD METHOD

Applies only to the detachable Apple IIGS keyboard (If you are using an upgraded Apple IIe, contact Don Johnston Developmental Equipment, Inc.)

FOR THE PERSON WHO:

- Can use the detachable Apple IIGS keyboard by means of
 - a single finger
 - a headwand
 - a mouthwand
-

ADVANTAGES:

- You never need to hold down two or more keys at the same time
 - Single presses of letters will not repeat if you stay on a key too long
 - Quick accidental presses need not trigger keys
 - Keys may be redefined as single characters or strings of characters
 - You can have up to 10 levels of characters on any key
-

RATE:

The rate set in this method (1-29) will affect how quickly the keyboard responds to your touch — 1 means you must wait on one key for a fairly long time; 29 means the keyboard responds very quickly.

INPUT DEVICES:

Speech synthesizer (optional)

A keyguard, headwand, or mouthwand (optional)

WHAT THE METHOD DOES:

The AFC assisted keyboard method provides software latching for the SHIFT, CONTROL, COMMAND/OPEN-APPLE, and OPTION/SOLID-APPLE keys in a way that does not require holding down more than one key at a time. In addition, this method provides a keypress-delay time, to help eliminate accidental keypresses. It also modifies the AUTO-REPEAT of the Apple IIGS: if you press a key three times, the *third press*, rather than the first or second, will enable the AUTO-REPEAT. The keypress delay and the repeat rate are adjustable by the user.

More About the Method

STANDARD OVERLAY

The standard assisted keyboard overlay consists of the characters shown on the Apple keyboard. Any keys which should normally be held down *at the same time* may be *pressed in sequence* instead.

REDEFINED OR CUSTOMIZED OVERLAYS

Assisted keyboard overlays may include keys which have been redefined to be a different character or function than printed on the key. For example, the number '6' could be redefined as an UP ARROW and the letter 'B' redefined as a DOWN ARROW. Up to ten levels of characters may be stored on any one key. In a redefined standard overlay, any keys not redefined are standard characters. In a customized overlay, any keys not redefined are null — they provide no input to the Apple. In any type of overlay, one key may be a single character or a string of up to 100 characters.

TALKING OVERLAYS

Talking assisted keyboard overlays provide speech feedback (from your speech synthesizer) after a key is pressed.

Examples on the Extended Menu

To see what's available on your Extended Menu, use the Simplify/Expand option at the end of the Extended Menu to display setups for ASSISTED KBD ONLY. (See Chapter 1, page 1-16.) When the simplified menu appears, move the cursor to any of the setups and press RETURN for a description. You may load any of these setups and use them with appropriate application software.

If the Apple keyboard is responding too slowly or too quickly, you can change the rate for the assisted keyboard. If the the third-press repeat is too fast or too slow, you can change the special option of REPEAT RATE. (To change the rate or the repeat rate, select MAKE CHANGES from the Choices window or use CONTROL-A 1 or 2, respectively, as described in Chapter 4.)

For more information, see the chapter titled ASSISTED IIGS KEYBOARD.

PARTIAL LISTING OF EXAMPLE SETUPS:

<u>TITLE</u>	<u>INPUT</u>	<u>OVERLAY</u>	<u>FOR USE WITH</u>	<u>FOR HELP</u>
S.Assisted	asst	Standard	Text Demo or any program	see "Using ..." in ASSISTED KBD chapter
T.Assisted	asst	Talking Standard	Text Demo or any program	
Amy's Alex	asst	Redefined	Alex the Rabbit or any program using 4 ARROWS	see demo, page 3-37
Mouse Demo	asst	Standard	Mouse emulation tutorial	see "Using ..." in Chapter 18

Additional setups may be available on your Menu Disk.

THE EXPANDED KEYBOARD METHOD

FOR THE PERSON WHO:

- Can use an alternate (larger or smaller) keyboard, such as the Unicorn Expanded Keyboard or the TASH King or Mini Keyboards
-

ADVANTAGES:

- Alternate keyboards may be expanded or miniature in size
 - Keys may be defined as single characters or strings of characters
 - Keys may be grouped into larger blocks
 - You can have up to 10 levels of characters for any key or block
 - Keys/blocks may be labelled with pictures, symbols, or large letters
-
-

RATE:

The rate set in this method (1-29) will affect how quickly the keyboard responds to your touch — 1 means you must wait on one key for a fairly long time; 29 means the keyboard responds very quickly.

INPUT DEVICES REQUIRED:

- An expanded or miniature keyboard, such as the Unicorn Expanded Keyboard, the King Keyboard, the Mini Keyboard, the Narwhal Board, or the Florida Expanded Keyboard
 - Speech synthesizer (optional)
-

WHAT THE METHOD DOES:

With the expanded keyboard method, you run the Apple by touching keys (or blocks of keys) on an alternate keyboard. The information sent to the computer in one touch may be a single letter, a word, or any combination up to 100 characters long.

More About the Method

STANDARD OVERLAYS

Standard keyboard overlays are intended for general use in situations where access to all keyboard characters is important. Different standard overlays exist for the Unicorn and TASH keyboards. Each includes all of the letters, numbers, and special keys or characters on the standard Apple keyboard.

To use the Standard Unicorn Overlay with your Unicorn Keyboard, load the setup titled S.Unicorn. For a standard Unicorn overlay that talks, use the T.Unicorn setup. These setups also apply to the Narwhal and Florida keyboards, since their standard overlays have the same arrangement of characters as the standard Unicorn overlay.

To use the characters as printed on a King or Mini Keyboard from TASH, load the S.KingMini setup on your Extended Menu. For a talking standard overlay, use the T.KingMini setup.

REDEFINED OR CUSTOMIZED OVERLAYS

Expanded keyboard overlays can be specifically tailored to the user, the application software, and the input device. You can create a redefined standard overlay (based on the standard overlay for your keyboard) or you can create a customized overlay (one made from scratch). A customized overlay might be very simple, such as two choices, one on each half of the alternate keyboard. Any expanded keyboard overlay can also be very complex, consisting of up to ten levels of characters on one key.

TALKING OVERLAYS and TALKING WORD BOARD

Talking overlays provide speech feedback (from your speech synthesizer) when you press a key on the expanded keyboard. Talking overlays are part of some setups on the Extended Menu.

If you want to use your alternate keyboard as a talking word board — that is, to talk and *not* to run other programs — you would *not* use setups on the Menu Disk. Instead, you would use the Talking Word Board program on your Sample Application Software disk.

Examples on the Extended Menu

To see what's available on your Extended Menu, use the Simplify/Expand option at the end of the Extended Menu to display setups for EXPANDED KBD ONLY. (See Chapter 1, page 1-16.) When the simplified menu appears, it will show setups pertaining to the expanded keyboard method. Move the cursor to any of the setups and press RETURN for a description. You may load any of these setups and use them with appropriate application software.

If your expanded or miniature keyboard is responding too slowly or too quickly, you can change the rate for the expanded keyboard method. (Select MAKE CHANGES from the Choices window or use CONTROL-A 1, described in Chapter 4.)

For more information, see the chapter titled EXPANDED KEYBOARD.

PARTIAL LISTING OF EXAMPLE SETUPS:

<u>TITLE</u>	<u>INPUT</u>	<u>OVERLAY</u>	<u>FOR USE WITH</u>	<u>FOR HELP</u>
S.Unicorn	Unic	Standard Unicorn Kbd	Text Demo or any program	see "Using ..." in EXPANDED KEYBD chapter
S.KingMini	TASH	Standard TASH King/Mini Kbd	Text Demo or any program	see "Using ..." in EXPANDED KEYBD chapter
Ed's Alex	Unic	Customized	Alex the Rabbit or any program using 4 ARROWS	see demo and paper layout, pages 3-38 and 3-39
32 key #'s	Unic	Customized	Lemonade Stand	
Drink Ride	Unic	Customized	TAG Sampler	see "Designing Levels" in Chapter 7

Additional setups may be available on your Menu Disk.

THE MORSE CODE METHODS

FOR THE PERSON WHO:

- Can control 1 or 2 switches
 - Can remember and sequence signals to send Morse Code
-

ADVANTAGES:

- No visual display is needed
 - Highly efficient system for a two-switch user:
 - Headswitch users have been known to reach keyer rates of 11 WPM
 - Sip-and-puff users have been known to reach keyer rates of 30 WPM
 - You can have up to 10 levels of characters for any code
-

VARIATIONS:

- In **two-switch automatic-keyer Morse code**, you use switch #1 to send correctly timed *dits* and switch #2 to send correctly timed *dahs*. You only need to make one movement (to close the switch) to send several *dits* or *dahs* in a row.
 - In **one-switch straight-key Morse code**, you use only one switch. You must make a separate movement (a separate switch closure) for each *dit* and each *dah*, and you must correctly time each signal and the pauses between signals within a letter.
-
-

RATE:

- The rate you set in **two-switch automatic-keyer Morse code** determines how rapidly the *dit* and *dah* signals are sent when you hold switch #1 or switch #2 closed.
 - The rate you set in **one-switch straight-key Morse code** determines how quickly you must get off the switch before a *dit* becomes a *dah*.
 - In either case, a higher number, such as 10, is a faster rate than a lower number, such as 3.
-

INPUT DEVICES REQUIRED:

- **Two-switch automatic-keyer Morse code:**
two switches OR the OPEN-APPLE and OPTION/SOLID-APPLE keys
 - **One-switch straight-key Morse code:**
one switch OR the OPEN-APPLE key
 - Speech synthesizer (optional)
-

WHAT THE METHOD DOES:

With the AFC Morse code methods, you press one or two switches to send sequences of *dit* and *dah* signals. The AFC translates these signals into computer keyboard characters and sends them to the computer, just as if they had been typed on the keyboard. *Dit* and *dah* tones are generated by the computer as feedback to the user.

More About the Method

STANDARD OVERLAYS

Standard Morse code overlays include International Morse Code and additional codes for all the keys on the Apple keyboard, such as

A	• -	H	• • • •	O	- - -	V	• • • -
B	- • • •	I	• •	P	• - - •	W	• - -
C	- • - •	J	• - - -	Q	- - • -	X	- • • -
D	- • •	K	- • -	R	• - •	Y	- • - -
E	•	L	• - • •	S	• • •	Z	- - • •
F	• • • •	M	- -	T	-	.	• - - - • -
G	- - •	N	- •	U	• • -	?	• • - - • •

SPACE	• • - -	CONTROL	- • - • • •	1	• - - - -	6	- • • • •
RETURN	• - • -	OPEN-APPLE	- • - • • •	2	• • - - -	7	- • • • •
ESC	- - - •	OPTION/SOL.AP	• • • - • •	3	• • • - -	8	- - - • •
←	- - - -	UP ARROW	- - • - -	4	• • • • -	9	- - - - •
→	• • - • • -	DOWN ARROW	- - • • •	5	• • • • •	0	- - - - -

Additional codes in the standard Morse code overlay are listed in the MORSE CODE chapter.

REDEFINED OR CUSTOMIZED OVERLAYS

Morse code overlays can include signals that have been redefined for special applications, such as "quick" number codes for use in a spreadsheet, or special codes defined for motor training. In a redefined standard overlay, any codes not redefined are standard. In a customized overlay, any codes not redefined are null. A motor training example might be:

dit = RIGHT ARROW *dah* = LEFT ARROW *dit-dah* = RETURN

TALKING OVERLAYS

Talking Morse code overlays provide speech feedback (from your speech synthesizer) after a signal is sent.

Examples on the Extended Menu

To see what's available on your Extended Menu, use the Simplify/Expand option at the end of the Extended Menu to display setups for MORSE CODE ONLY. (See page 1-16.) When the simplified menu appears, move the cursor to any of the setups and press RETURN for a description. You may load any of these setups and try them out with appropriate application software.

If a setup uses Morse code, you can change the method to any of the Morse code variations. You can also change the rate. (Select MAKE CHANGES from the Choices window or use CONTROL-A 1, described in Chapter 4.)

For more information, see the MORSE CODE chapter.

PARTIAL LISTING OF EXAMPLE SETUPS:

<u>TITLE</u>	<u>INPUT</u>	<u>OVERLAY</u>	<u>FOR USE WITH</u>	<u>FOR HELP</u>
S.Morse	code	Standard	Text Demo or any program	see "Using ..." in the MORSE CODE chapter
T.Morse	code	Talking Standard	Text Demo or any program	see "Using ..." in the MORSE CODE chapter
RedefMorse	code	Redefined Standard	Text Demo or any program	see the MORSE CODE chapter
Mel's Alex	2-sw	Redefined	Alex the Rabbit or any program using only 4 ARROWS	see demo page 3-41
Make Faces	2-sw	Redefined	Facemaker (Golden Edition) — the "program" portion	see chapter titled ONE SWITCH, TWO SWITCH ...
Space Ret	code	Redefined	Any program needing only SPACE and RETURN	see chapter titled ONE SWITCH, TWO SWITCH ...

Additional setups may be available on your Menu Disk.

THE SCANNING METHODS

FOR THE PERSON WHO:

- Can control 1-2 switches
 - Can track and interact with a moving cursor
-

ADVANTAGES:

- Control of only one switch is needed
 - Use switch to select from a visual display of characters
 - Visual displays can be very simple, if desired
-

VARIATIONS:

- In **regular scanning**, the cursor moves by itself — when the cursor is on the item you want, you press the switch to stop it.
 - In **step scanning**, you press the switch repeatedly (as if counting) to move the cursor across the array, then when the cursor is on the item you want, release the switch and wait.
 - In **inverse scanning**, while you hold the switch closed, the cursor moves across the array — when the cursor is on the item you want, release the switch and wait OR press switch #2.
-

RATE:

- **Regular scanning:** the rate you set determines how quickly the cursor moves across the scanning array.
 - **Step scanning:** the rate you set determines how long the AFC waits, after you release the switch, before it accepts the item under the cursor as the one you want.
 - **Inverse scanning:** the rate you set determines both the speed of cursor movement and the acceptance time.
 - In any scanning method, a higher number such as 8, is a faster rate than a lower number, such as 3.
-

INPUT DEVICES REQUIRED:

- **Regular or step scanning:**
one switch OR the OPEN-APPLE key
 - **Inverse scanning:**
one or 2 switches OR the OPEN-APPLE & OPTION/SOLID-APPLE keys
 - Speech synthesizer (optional)
-

WHAT THE METHOD DOES:

With the AFC scanning methods, when you press a switch, a line of choices appears on the second-to-the-bottom line of the screen. You then use the switch in various ways, depending on the exact scanning method, to select the item that you want. The line of choices is called an ARRAY.

STANDARD OVERLAYS

Standard scanning overlays are intended for general use in situations where access to all keyboard characters is important. Two standard overlays are available, each consisting of three interbranching arrays, containing all of the letters, numbers, and special keys or characters on the Apple keyboard.

In the standard ABC overlay, the letters are presented in alphabetical order; this may be helpful in first introducing or studying the scanning methods.

```
R<#. +ABCDE\FGHIJ=KLMNO PQRST UVWXY Z.^*  
R<A. 0123 4567 89.+ *-/=  
QEC>^V.,?!; "$%&'()*+,@/:<=> []^` AODT
```

In the standard ETA overlay, the letters are presented according to the statistical frequency of their use. This, in the long run, is a more efficient arrangement.

```
R<#. +EOHWY\TIRUP=ANLBK SMFVQ DCXJZ G.^*  
R<A. 0123 4567 89.+ *-/=  
QEC>^V.,?!; "$%&'()*+,@/:<=> []^` AODT
```

REDEFINED OR CUSTOMIZED OVERLAYS

Scanning overlays can be specifically tailored to the user and the application software. You can redefine a standard overlay or you can create a customized overlay from scratch. Overlays can be very simple, such as
A B C or **UP DOWN LEFT RIGHT**, or very complex.

TALKING OVERLAYS

Talking scanning overlays provide the ability for the items on the array to be "spoken aloud" (by your speech synthesizer) as the cursor moves from item to item. This may make the choices on the array more understandable for many users.

Examples on the Extended Menu

To see what's available on your Extended Menu, use the Simplify/Expand option at the end of the Extended Menu to display setups for SCANNING ONLY. (See Chapter 1, page 1-16.) When the simplified menu appears, move the cursor to any setup and press RETURN for a description. You may load any of these setups and use them with appropriate application software.

If a setup uses scanning, you may change the method to any of the AFC scanning variations. You can also change the rate. (Select MAKE CHANGES from the Choices window or use CONTROL-A 1, described in Chapter 4.)

For more information, see the SCANNING chapter.

PARTIAL LISTING OF EXAMPLE SETUPS:

<u>TITLE</u>	<u>INPUT</u>	<u>OVERLAY</u>	<u>FOR USE WITH</u>	<u>FOR HELP</u>
S.Scan.ABC or S.Scan.ETA	scan	Standard ABC Standard ETA	Text Demo or any program	see "Using ..." in the SCANNING chapter
T.Scan.ABC or T.Scan.ETA	scan	Talking ABC Talking ETA	Text Demo or any program	see "Using ..." in the SCANNING chapter
Up Down	scan	Customized	Alex the Rabbit	see demo, Chapter 1
Rotating >	scan	Customized	Alex the Rabbit or any program using 4 ARROWS	see demo, Chapter 1
Lemonade	scan	Customized	Lemonade Stand or any program using 0-9, RETURN, Y, N.	
Drink Ride	scan	Customized	TAG Sampler	see Chapter 15
Make Faces	scan	Customized	Facemaker (Golden Ed.) — the "program" portion	see Chapter 15

Additional setups may be available on your Menu Disk.

THE MULTIPLE SWITCH BOX METHOD

FOR THE PERSON WHO:

- Can use one or more switches as keys (not scanning or Morse code)
-

ADVANTAGES:

- The AFC I/O box allows 1-2 switches to be defined
 - Commercial multiple switch boxes allow up to 8 switches to be defined
 - Multiple switch boxes may be built for one to 128 switches
 - Each switch is defined as a directly selected item (no scanning involved), with up to 10 levels per switch.
 - Ideal for group interaction, where each user has one or more switches
-
-

RATE:

The rate set in this method (1-29) will affect how quickly the AFC responds to the switch closure — 1 means you must hold the switch closed for a fairly long time; 29 means the AFC will respond to a very brief switch closure.

INPUT DEVICES REQUIRED:

- **For 3 or more switches:**
a multiple switch box with the desired number of switches. This box connects to the 36 pin connector on the AFC I/O box.
 - **For 1 or 2 switches:**
a multiple switch box is not necessary — the switches can be connected to a multiple switch box OR directly to the I/O box.
 - Speech synthesizer (optional)
-

WHAT THE METHOD DOES:

With the multiple switch box method, you run the Apple by touching switches as if these were keys on a keyboard. The information sent to the computer in one touch may be a single letter, a word, or any combination up to 100 characters long.

More About the Method

CUSTOMIZED OVERLAYS

There is no standard overlay for the multiple switch box method. You must use a customized overlay, one which defines the characters each switch sends to the computer. One switch may send one character or a string of up to 100 characters. Up to ten levels of characters may be stored for any switch.

TALKING OVERLAYS and TALKING WORD BOARD

Talking overlays provide speech feedback (from your speech synthesizer) when you press a switch using the multiple switch box (MSB) method. Talking MSB overlays are part of some setups on the Extended Menu.

If you want to use your multiple switches as a talking word board — that is, to talk and *not* to run other programs — you do not use setups on the Menu Disk. Instead, you would use the Talking Word Board program on your Sample Application Software disk.

To use the Talking Word Board with switches, the switches *must* be connected to a multiple switch box. The OPEN-APPLE and OPTION/SOLID-APPLE KEYS or switches connected directly to the I/O box *cannot* be used as a Talking Word Board.

Examples on the Extended Menu

To see what's available on your Extended Menu, use the Simplify/Expand option at the end of the Extended Menu to display setups for MULTI-SWITCH BOX ONLY. (See Chapter 1, page 1-16.) When the simplified menu appears, it will display MSB setups for 1 or 2 switches connected to the I/O box or for 3 or more switches connected to the multiple switch box manufactured by Don Johnston Developmental Equipment, Inc. Move the cursor to any of the setups and press RETURN for a description. You may load any of these setups and use them with appropriate application software.

If the AFC is responding too slowly or too quickly when you press the switches, you can change the rate for the multiple switch box method. (Select MAKE CHANGES from the Choices window or use CONTROL-A 1, described in Chapter 4.)

For more information about the multiple switch box method, see the chapter titled THE MULTIPLE SWITCH BOX.

PARTIAL LISTING OF EXAMPLE SETUPS:

<u>TITLE</u>	<u>INPUT</u>	<u>OVERLAY</u>	<u>FOR USE WITH</u>	<u>FOR HELP</u>
Eve's Alex	4-sw	Customized	Alex the Rabbit or any program using 4 ARROWS	see demo, page 3-42
Drink Ride	2-sw	Customized	TAG Sampler	see chapter titled ONE SWITCH, TWO SWITCH ...
Space Ret	2-sw	Customized	Any program needing only SPACE and RETURN	

Additional setups may be available on your Menu Disk.

THE NORMAL-INPUT METHOD

FOR USE WITH:

- Switch-input software
-

ADVANTAGES:

- The AFC I/O box may be used as a switch interface box for application programs which were designed to be operated with one or two switches.
 - The AFC special option of SLOWDOWN lets you slow down any interactive program. This can be useful if the slowest setting within the program is too fast.
 - The AFC special option of CLICK FEEDBACK lets you add a computer tone as feedback when the switch closure has been accepted.
 - The AFC special option of SWITCH DELAY lets you enter a switch-activation delay, so that the AFC will not register a switch press until the switch has been closed for a certain delay period. This can help screen out accidental presses.
 - The two halves of the Unicorn Expanded Keyboard can be used as two large switches.
-
-

RATE:

The rate setting in this method has no effect on anything!

INPUT DEVICES REQUIRED:

- **One or two switches:**

The switch connected to jack #1 will be switch #1; the switch connected to jack #2 will be switch #2

- **Unicorn Expanded Keyboard:**

The *right* half will be switch #1; the *left* half will be switch #2.

WHAT THE METHOD DOES:

This method assumes you do *not* want to use your input device to emulate the Apple keyboard, as you do with AFC scanning, Morse code, assisted keyboard, or an expanded keyboard with keyboard characters, but that you *do* want to use your switches or expanded keyboard which are connected to the AFC I/O box and that you may want to use special AFC options, such as SLOWDOWN. (If you need *both* keyboard emulation and switch-input for an application program, see Chapter 21.)

More About the Method

SWITCH-INPUT SOFTWARE:

If your application program was designed for switch input, such as the programs listed below, and you want to use switches which are connected to the AFC I/O box, all you need to do is connect the switches, turn the AFC ON, and use a setup with the AFC NORMAL-INPUT method, such as the setup titled Normal or the setup titled Sw Input.

Examples of switch-input software include the following.
(See Appendix D for publishers.)

Catch the Cow, by Birch

Creature Antics, by Laureate Learning Systems, Inc.

First Words, by Laureate Learning Systems, Inc.

Interaction Games, by Don Johnston Developmental Equipment, Inc.

Motor Training Games, by Schwejda and McDonald

The Rabbit Scanner, by Rettig and Greenlee

Single Input Control Assessment, by Hugh MacMillan Medical Centre

Symbol Writer, by Don Johnston Developmental Equipment, Inc.

ADJUSTING SPECIAL OPTIONS:

To adjust SLOWDOWN, CLICK FEEDBACK, or SWITCH DELAY, you can use the Make Changes ... Special Options window on the Menu Disk, or you can use CONTROL-A 2 while using the application program.

For help using the Make Changes ... Special Options window, see "Make Changes in Setup ... Special Options" in Chapter 6.

For help using CONTROL-A 2, see Chapter 4.

Examples on the Extended Menu

To see what's available on your Extended Menu, boot the AFC Menu Disk and use the Simplify/Expand option at the end of the Extended Menu to display SWITCH INPUT SETUPS. (See Chapter 1, page 1-16.) When the simplified menu appears, it will show setups which were designed for control by one or more switches. The input methods will include scanning, Morse code, and MSB (multiple switch box), as well as setups with the normal-input method. Move the cursor to any of these setups and press RETURN for a description. You may load any of these setups and use them with appropriate application software.

For more information about switch-input software, see the chapter titled ONE SWITCH, TWO SWITCH, RED SWITCH, BLUE SWITCH.

PARTIAL LISTING OF EXAMPLE SETUPS:

<u>TITLE</u>	<u>INPUT</u>	<u>FOR USE WITH</u>	<u>FOR HELP</u>
Sw Input	1-sw OR 2-sw	Switch-input programs, such as Shapes Dragon or First Words in scanning mode	see demo, page 3-43
Normal	1-sw OR 2-sw	Same as Sw Input setup.	

Additional setups may be available on your Menu Disk.

THE ASCII-INPUT METHODS

FOR THE PERSON WHO:

- Would like to use an ASCII communication device to operate the Apple
-

EXAMPLES OF ASCII COMMUNICATION DEVICES:

- ACS SpeechPAC/Epson, by Adaptive Communication Systems, Inc.
 - Light Talker, by Prentke Romich Co.
 - Touch Talker, by Prentke Romich Co.
 - MOD Keyboard Systems, by TASH, Inc.
-

VARIATIONS:

Parallel ASCII
Serial ASCII

RATE :

- **Parallel ASCII:** the rate setting has no effect
 - **Serial ASCII:** you must set the AFC rate to correspond with the rate of the signal (the BAUD rate) being sent by the communication device.
-

WHAT THE METHOD DOES:

The ASCII-input methods allow you to connect certain portable communication devices to the AFC and to use the AFC as a keyboard emulating interface (KEI) for the portable communication device. For this to work, the device must have a parallel or serial port by which it can send characters in a standard form (ASCII — the American Standard Code for Information Exchange). A special cable must be used to connect that port to the AFC I/O box.

More About the Method

PARALLEL OR SERIAL

Some devices, such as the Elementary MOD Keyboard System, send out **parallel ASCII**. Other devices, such as the Light Talker and Touch Talker, send out **serial ASCII**. In either case, the AFC can "translate" the signal for the Apple computer, provided the method and rate settings are correctly set for your particular device.

If your device sends parallel ASCII, the AFC input method must be parallel ASCII. The AFC rate setting doesn't matter.

If your device sends serial ASCII, the AFC input method must be serial ASCII, and the AFC rate must correspond to the BAUD RATE sent by the device.

SPECIAL CHARACTERS:

The setup called S.ASCII on the Extended Menu is a general-purpose ASCII-input setup which will work with communication devices which follow the Trace KEI Compatibility Standard. This means that you can probably follow instructions which came with your communication device to program special characters, such as OPEN-APPLE, RESET, TAB, etc.

If your communication device does not follow the Trace Standard, the AFC provides the flexibility to obtain special characters in a variety of ways. For example, you might want to use an overlay which redefines some (rarely used) characters from your device, such as a left bracket, to be the characters required by some software, such as an OPEN-APPLE.

For more information, see the chapter titled ASCII INPUT. Also see the instructions which came with your device-to-AFC cable.

COMPATIBILITY:

If you would like to know if a device can be used with the AFC or where to order a cable for the device, call Don Johnston Developmental Equipment, Inc. or the device manufacturer.

Demo: Assisted Keyboard with Redefined Characters for Alex the Rabbit

1. Boot the AFC Menu Disk.
2. Move the cursor to AMY'S ALEX; press RETURN.

The Description window explains that this setup uses the assisted keyboard method and that four keys have been redefined as ARROW keys. The keys are

Y	redefined as	UP
D	redefined as	LEFT
B	redefined as	DOWN
L		RIGHT

3. Load the setup.
4. Turn the AFC ON (if it is not already on).
5. Place the Sample Application Software disk in Drive 1.
6. Press RETURN.
7. Select ALEX THE RABBIT from the menu.
8. Press RETURN to start the Alex program.
9. Use a headwand (or use your pencil or a finger and pretend it is a headwand) and press

Y to send Alex UP
D to send Alex LEFT
B to send Alex DOWN
L to send Alex RIGHT

In this setup, these four keys have been redefined as ARROW keys for a headwand user who has difficulty using the four ARROW keys on the computer keyboard — on the Apple, the four ARROW keys are on the lower right and are all lined up next to each other in one row. Additional assists in this application might be an appropriate arrow sticker on each of the redefined keys and perhaps a cardboard keyguard, with only four holes cut out — for the keys Y, D, B, and L.

Demo: Unicorn Keyboard with a Customized Overlay for Alex the Rabbit

In this setup, a customized overlay for the Unicorn has been created for a user who can comfortably touch 2X2 blocks in the lower right corner of the Unicorn. The two blocks above these have been customized to send RETURN — this starts the game and, during the game, can make Alex wiggle his ears.

Connect your Unicorn Keyboard to the I/O box while the computer is OFF.

If you have a Unicorn Model I Keyboard, we recommend using a dead-spot eliminator with this setup. (See the chapter titled FACTORS AND RESOURCES.)

1. Boot the AFC Menu Disk.
2. Move the cursor to ED'S ALEX; press RETURN.

The Description window explains that this setup uses a Unicorn Expanded Keyboard with an overlay consisting of four ARROW keys plus a RETURN key in 2 X 2 blocks in the lower right of the Unicorn. A corresponding paper overlay for this setup is on the next page — you may tear it out or copy it. Be sure to line it up correctly in the lower right corner of your Unicorn Keyboard. (The blocks must must line up exactly with the correct squares on the Unicorn.)

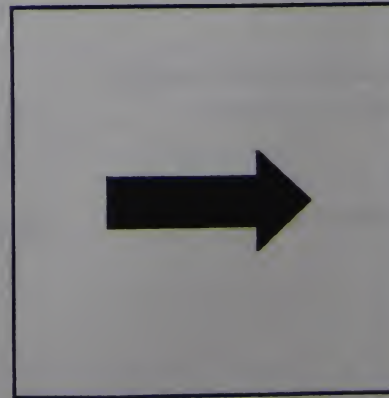
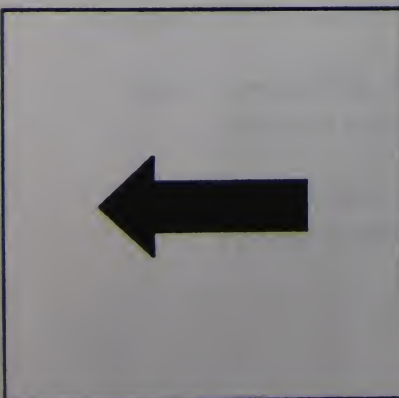
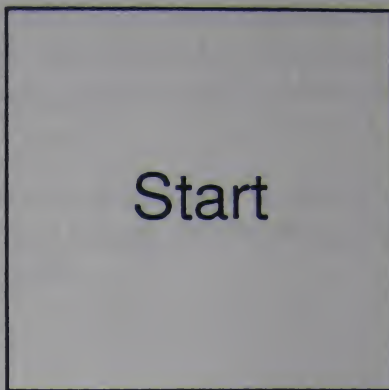
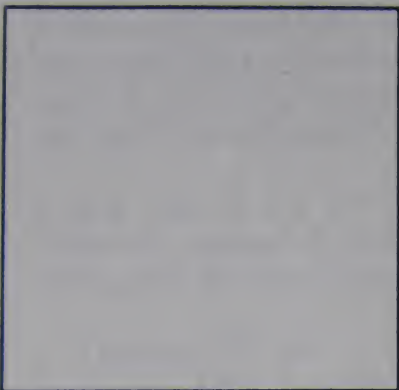
3. Load the setup.
4. Turn the AFC ON (if it is not already on).
5. Place the Sample Application Software disk in Drive 1.
6. Press RETURN.
7. Select Alex the Rabbit from the menu.
8. Press the RETURN key or the "START" square to start the Alex program.
9. Press the appropriate ARROW blocks on the Unicorn to send Alex UP, DOWN, RIGHT, or LEFT. Press a "GO" block to see Alex wiggle his ears.

PAPER OVERLAY

Name of Setup: Ed's Alex

Application Program: Alex the Rabbit

Cut as shown. Place bottom edge flush inside plastic cover of Unicorn Keyboard; right edge against right edge of Unicorn.



Demo: Morse Code with Characters Redefined for Alex the Rabbit

In this setup, Morse code characters were redefined so that four very short and simple codes could be used to run Alex the Rabbit. This setup could be useful in evaluating or training a young person's ability to remember and execute *dit* and *dah* signals.

If you wish to use two switches, connect them to the computer while the computer is OFF. You may use the OPEN-APPLE and OPTION/SOLID-APPLE keys, if you prefer.

1. Turn the AFC OFF.
2. Boot the AFC Menu Disk.
3. Move the cursor to MEL'S ALEX; press RETURN.

The Description window explains that this setup uses two switches and some non-standard codes. You will be able to run Alex the Rabbit just by sending one *dit*, one *dah*, two *dits*, or two *dahs*.

3. Load the setup.
4. Turn the AFC ON (if it is not already on).
5. Place the Sample Application Software disk in Drive 1.
6. Press RETURN.
7. Select Alex the Rabbit from the menu.
8. Press RETURN to start the Alex program.
9. Use your two switches (or OPEN-APPLE and OPTION/SOLID-APPLE keys) to move Alex through the maze:

LEFT press switch #1,
release it after one *dah*

RIGHT press switch #2,
release it after one *dit*

UP press switch #1,
release it after two *dahs*

DOWN press switch #2,
release it after two *dits*

Demo: Multiple Switches with a Customized Overlay for Alex the Rabbit

In this setup, a customized overlay was created for a multiple switch box, so that four switches could be used to send the four ARROW keys. One person could use all four switches; or two people could each use two switches; or a group of four users could run Alex, each person having one switch or one ARROW key.

Connect your multiple switch box and four switches while the computer is OFF. Connect the multiple switch box to the I/O box. Face the multiple switch box so that its cable is on your right. Connect the four switches to the top row of jacks.

1. Boot the AFC Menu Disk.
2. Move the cursor to EVE'S ALEX; press RETURN.
3. Load the setup.
4. Turn the AFC ON (if it is not already on).
5. Place the Sample Application Software disk in Drive 1.
6. Press RETURN.
7. Select Alex the Rabbit from the menu.
8. Press RETURN to start the Alex program.
9. Press the appropriate switches to send Alex UP, DOWN, RIGHT, or LEFT.

If the switches plugged into your multiple switch box do not seem to be sending ARROW keys, try turning the AFC OFF and plugging your switches into other jacks in the box. Then turn the AFC ON and try again. If this still does not work, it may be that your multiple switch box was built differently than the one used to create this setup. It doesn't mean that your box doesn't work — it just means you will need to create your own setup at a later time. (See the chapter titled THE MULTIPLE SWITCH BOX.)

Demo: Using Switch-Input Software such as Shapes Dragon with switches connected to the I/O box

To use switch-input software with the AFC, all you need to do is to plug one or two switches into the I/O box and use a setup with the AFC NORMAL-INPUT method. On your Extended Menu, the setups titled NORMAL and SW INPUT are already set to this method for you.

If you want to connect switches to the AFC I/O box, be sure to do so while the computer is OFF.

1. Turn the AFC OFF.
2. Boot the AFC Menu Disk.
3. Move the cursor to the NORMAL or SW INPUT setup; press RETURN.
4. Load the setup.
5. Turn the AFC ON (if it is not already on).
6. Place the Sample Application Software disk in Drive 1.
7. Press RETURN
8. Select Shapes Dragon from the menu.
9. Use switch #1 to run Shapes Dragon.

An even simpler way of doing this is to load the NORMAL or SW INPUT setup from the Quick-Start Menu. (For information about the Quick-Start Menu, see Chapter 4.)

CHAPTER 4

QUICK-START MENU and CONTROL-A FUNCTIONS

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CHAPTER 4

QUICK-START MENU and CONTROL-A FUNCTIONS

In the previous chapters, you became familiar with what you can do with AFC setups and the AFC Menu Disk. However, you do not necessarily need to use the Menu Disk each time you use the AFC! This chapter will explain how you can activate certain setups quickly and easily without using the Menu Disk and how you can make various changes in a setup while using an application program, such as changing the method, rate, or special option settings, shifting levels in the AFC overlay, or bringing up a communication window to communicate with another person. All this can be done without using the Menu Disk.

THE QUICK-START MENU

Until now, you have had to go through the following steps to "set up" your AFC for an application program:

1. Boot the AFC Menu Disk.
2. Select the desired setup from the Extended Menu.
3. Load the setup from the disk onto the AFC.
4. Remove the Menu Disk and insert your application disk.
5. The application disk boots, and you are ready to go.

Steps 1-4 are what is known as a *pre-boot* procedure: you had to do this *before* you could boot your application disk.

Now suppose, after going through this pre-boot procedure (which takes about 1 minute) for the 1,000th time (a total of 17 hours spent so far), it occurred to you that it might be nice if you could somehow skip steps 1-4. Just fantasizing for a minute, how could such a system work? Here are some ideas:

1. Maybe when you load a setup from the Extended Menu onto the AFC it could *stay there*, even after you turn off the computer.
2. Maybe a *number* of setups could be put onto the card and stay there. It isn't realistic to suppose that the card could hold the same number of setups as the Extended Menu, but maybe a handful of frequently used setups could be included.
3. When you first turn on the computer, you would have a way to activate one of these setups immediately, without using the Menu Disk.

In fact, this is no fantasy! Thanks to the AFC memory-backup system, this is precisely how things work. The "handful of setups" mentioned above is what we call the QUICK-START MENU: a smaller version of the Extended Menu which is always available as soon as you start up your system. It is limited to a small number of setups, and it does not have information windows, but it enables you to quick-start your system (activate a setup) without waiting for the Menu Disk to boot — you don't use the Menu Disk at all.

Quick-Start Demo

1. **Start with no disks in the drives.**
2. **Turn the computer OFF.**
3. **Turn the AFC ON.** (If the AFC is OFF, the Quick-Start Menu will *not* appear.)
4. **Turn the computer ON.**

You should hear a tone and see a screen similar to the one shown below:

AFC QUICK-START MENU	

SETUPS AVAILABLE ON THIS CARD:	
*NORMAL	NORMAL
ED'S ALEX	ASSISTED KBD IIGS
AMY'S ALEX	EXPANDED KEYBOARD
S.SCAN.ABC	REGULAR SCAN
ROTATING >	REGULAR SCAN
UP DOWN 20	REGULAR SCAN
UP DOWN	REGULAR SCAN

The AFC QUICK-START MENU is a list of setups available on your AFC — you can activate any of these setups for a *quick start*, without booting the Menu Disk at all!

The setups on your own Quick-Start Menu may not be the same as those shown above — your Quick-Start Menu will list the setups used most recently with *your* AFC.

If, when you turned the computer ON, you did not get the Quick-Start Menu and if, instead, the disk drive tried to boot a disk, turn everything OFF. Make sure the AFC toggle switch is flipped to ON (toward the red light) and try again. If you still do not get a Quick-Start Menu, see Troubleshooting (Appendix A).

We earlier described the Extended Menu as a large storeroom, dedicated to holding up to 100 setup modules, which you can peruse, test, or use. In this context, the Quick-Start Menu is not a storeroom but a small, personal shelf. Just as you might have a shelf of frequently-used application disks, right near your computer, the Quick-Start Menu is your shelf of frequently-used setups, saved *on* your AFC, always immediately available for you to use, even if the Menu Disk is not at hand.

The differences between the Extended Menu and the Quick-Start Menu are these:

The **Extended Menu** is *extensive*— it may have up to 100 setups, with information windows, help screens, and full editing capabilities. The Extended Menu lists the setups which are *on that Menu Disk* — you boot the disk, load a setup from the Extended Menu, then boot your application disk.

The **Quick-Start Menu** lets you *start more quickly* than the Extended Menu, because you don't need to boot a special disk. The Quick-Start Menu lists the setups which are *on the card itself*. This menu holds no more than 20 setups and does not include prompts or information windows — but it lets you *activate a setup without having to load it from a disk*. You turn on the AFC, then turn on the computer, then select your setup from the Quick-Start Menu.

5. **Look at the list of setups on your Quick-Start Menu.** These are all setups you (or someone else) used recently. **Decide which setup you would like to use again, for this demo.**
6. **Find the application software which goes with that setup. Put the application disk in the drive.**
7. **Move the cursor to the setup you want to use, then press RETURN.**

The drive will go on, booting the application disk.
You may now use the setup to run the application program.

You will not see any windows — no Description window or Choices window, etc. These windows are only available when you are using the Extended Menu. When you select a setup from the Quick-Start Menu, you're off to a quick start: that setup becomes immediately active and the application software boots automatically.

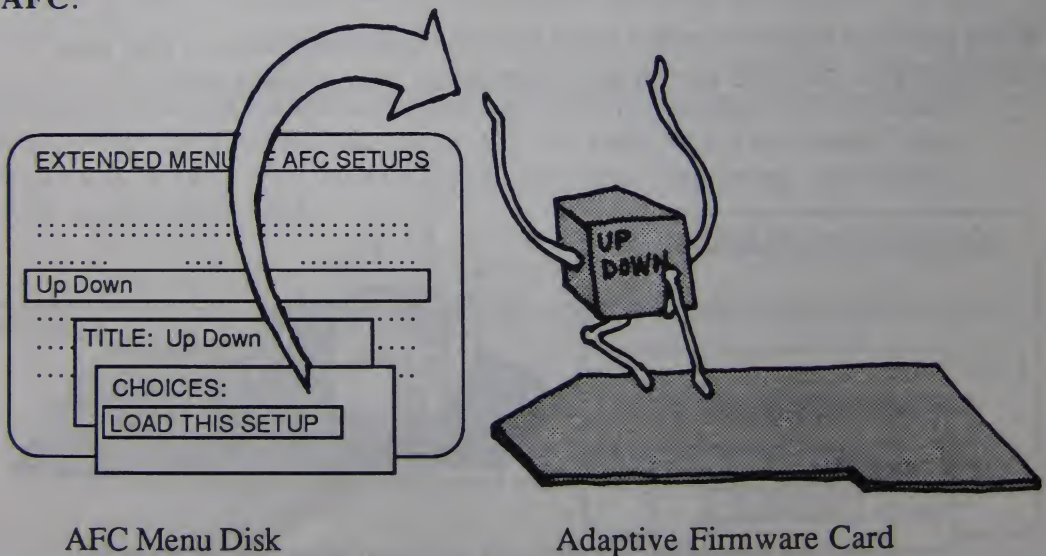
Summary: Using the Quick-Start Menu makes everyday use of the AFC as easy as 1-2-3:

1. Place application disk in drive. Connect input device. Turn AFC on.
2. Turn computer on. Quick-Start Menu appears.
3. Select desired setup. Disk boots — and you're in business.

How the Quick-Start Menu Works

To explain how the Quick-Start Menu works, we need to explain a bit more about how the AFC works.

In Chapter 2, we discussed a setup as a module which tells the AFC what you want it to do. The module includes information about method/rate, special options, overlay, and (optional) macros. When you select **LOAD THIS SETUP** on the Extended Menu, the computer **copies that setup onto the AFC**:

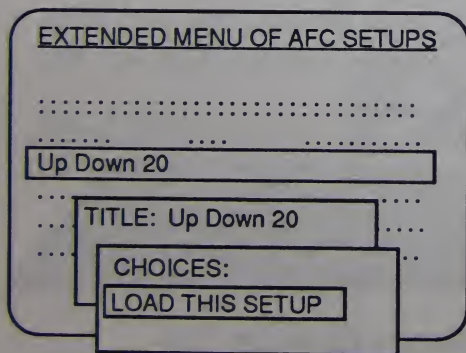


When you load a setup from the Extended Menu, a copy of the setup is placed *on* the AFC and immediately *activated* for you to use with your application software:

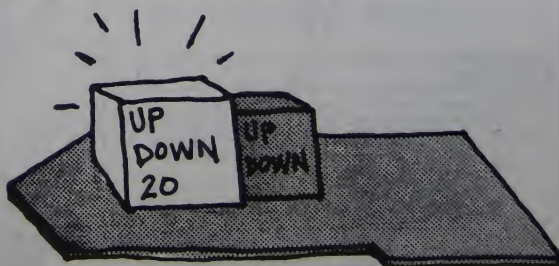


What you may not have known is that **when you turn off the computer, that copy of the setup stays *there*** (on the card).

When you load and use another setup from the Extended Menu, it also goes onto the AFC: the AFC moves any other setups over to make room.



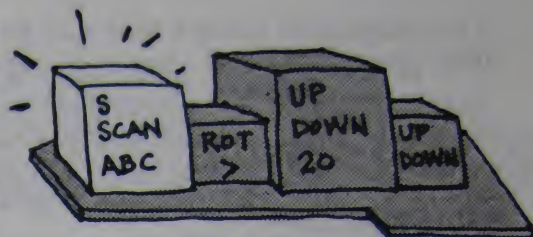
AFC Menu Disk



Adaptive Firmware Card

If you used only the demos in Chapters 1-2, you would have had these setups on your card, as shown below.

AFC QUICK-START MENU	
SETUPS AVAILABLE ON THIS CARD:	
S.SCAN.ABC	REGULAR SCAN
ROTATING >	REGULAR SCAN
UP DOWN 20	REGULAR SCAN
UP DOWN	REGULAR SCAN



These setups stay on the card because of the AFC memory-backup system.

Getting back to how the Quick-Start Menu works: **the Quick-Start Menu is simply the AFC's list of setups which are stored for you *on this card*.**

Because the setups are already stored *on* the card, you don't need to "load" them. With the Quick-Start Menu, **all you need to do is "select" the setup you want: this immediately *activates* the setup and boots your application disk.**

Summary:

- If the setup you want is on the **Quick-Start Menu**, you just need to activate it: be sure your application disk is in the drive, move the cursor to the setup you want, then press RETURN.
 - If the setup you want is not on the Quick-Start Menu, you need to load it from a disk: put the **Menu Disk** in the drive and press RETURN. When the **Extended Menu** appears, move the cursor to your setup, load the setup, and put in your application disk when the **SETUP IN EFFECT** window appears.
-

Learning More About the Quick-Start Menu

At this point, you may be wondering how many setups can be stored on the card and what happens when you have too many.

The number of setups that can be stored on the card depends upon their size. "Size" of a setup means how much memory the information takes up on the AFC (or how much room it needs on the shelf). **As many as 20 setups will fit on the Model G32 AFC**, provided they are small setups. If your setups are large, you may be limited to a smaller number.

For example, a setup written to include speech feedback in the overlay will take three to five times as much room as the same setup created without speech feedback. A setup with multiple levels or with macros will take up more room than a setup with a one-level overlay of single characters. (You'll learn more about creating a setup in Chapter 7 and in Part II of this manual.)

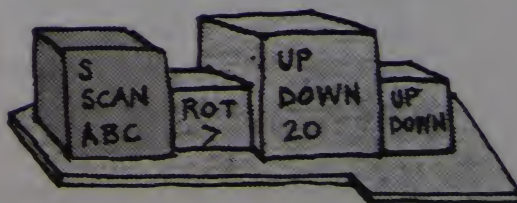
In technical terms, the Quick-Start Menu can hold up to 4,000 bytes or characters. This means it could hold 20 setups of 200 bytes each, 10 setups of 400 bytes each, or 4 setups of 1000 bytes each. To find out the size of a setup, highlight that setup on the Extended Menu, bring up the Choices window, and select GET MORE INFORMATION ... VITAL STATISTICS. The Vital Statistics window will list "size" and will give the number of bytes (characters) in that setup.

If the AFC's memory for setups is full, and you try to load a new setup from the Extended Menu, the AFC automatically makes whatever room it needs for the new setup by clearing out (or knocking off) the oldest setups. Suppose, for example, that your Quick-Start Menu, as shown below, is "full."

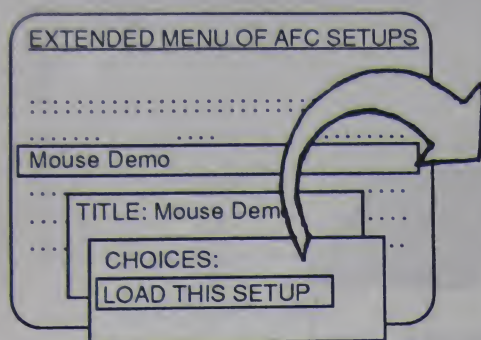
AFC QUICK-START MENU

SETUPS AVAILABLE ON THIS CARD:

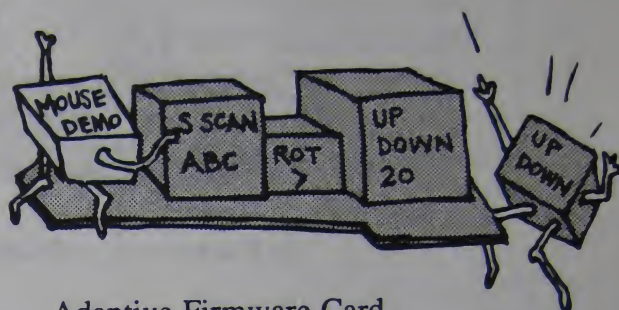
S.SCAN.ABC	REGULAR SCAN
ROTATING >	REGULAR SCAN
UP DOWN 20	REGULAR SCAN
UP DOWN	REGULAR SCAN



When you load another setup, the AFC makes room, as needed.

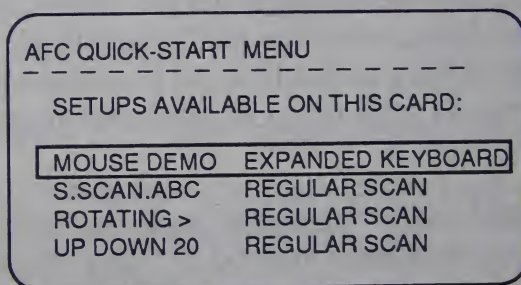


AFC Menu Disk



Adaptive Firmware Card

When you next use your Quick-Start Menu, you'll notice that one or more setups have "fallen off" the bottom of the Menu, as shown below.

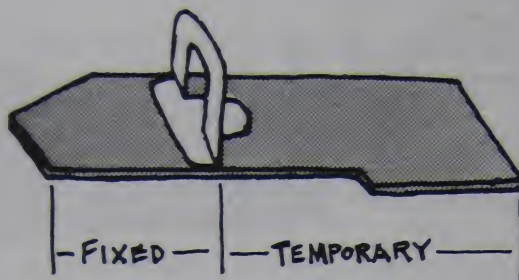


Note: You do *not* lose the setup — what is on the AFC is just a copy — you still have the "original" of that setup on your Menu Disk, so you can re-load and use it at any time.

TEMPORARY VERSUS FIXED QUICK-START MENU

What we have been describing so far is clearly a **TEMPORARY** Quick-Start Menu: the AFC automatically stores setups for you *and* automatically removes them as room is needed. **If you want certain setups to *stay* on the Quick-Start Menu in a more permanent fashion, you can move them to a **FIXED** portion of the Quick-Start Menu — setups in the fixed part of the menu will not be automatically removed by the AFC.**

To introduce the fixed Quick-Start Menu, let's add a movable divider to your personal shelf of setups. Think of this as a bookend which slides on a track. You can move it left or right as needed.



Any setups which you place to the left of the divider are in the **FIXED** part of the Quick-Start Menu: they will be the first setups listed on the Quick-Start Menu and will stay on the Quick-Start Menu until you remove them.

The area to the right of the divider is still the **TEMPORARY** part of the Quick-Start Menu, where the AFC automatically stores setups which you recently loaded from the Extended Menu and automatically removes some setups as more room is needed.

This imaginary divider has a real counterpart — the double dotted line near the top of your Extended Menu. **The area above the double-dotted line on the Extended Menu indicates the fixed Quick-Start Menu. Setups above this line, like the one titled Normal, will appear at the beginning of the Quick-Start Menu, will be marked with an asterisk, and will not be automatically moved or removed by the AFC.**

When you look at the Quick-Start Menu, the setups marked with an asterisk are in the fixed Quick-Start Menu. Setups not marked with an asterisk are in the temporary part of the Quick-Start Menu. This is illustrated in the drawing on the next page.

EXTENDED MENU OF AFC SETUPS		
Normal		
.....		
.....
.....
.....
.....
.....

AFC Menu Disk

AFC QUICK-START MENU	

SETUPS AVAILABLE ON THIS CARD:	
* NORMAL	NORMAL
S.SCAN.ABC	REGULAR SCAN
ROTATING >	REGULAR SCAN
UP DOWN 20	REGULAR SCAN

Adaptive Firmware Card



ADDING SETUPS TO THE FIXED QUICK-START MENU

You can add setups to the fixed Quick-Start Menu by using **CONTROL-R (Rearrange)** to move setups above the double dotted line on the Extended Menu.

To see how this works, try this demonstration.

1. Boot the Menu Disk.

When the Extended Menu appears, notice the line of double dots below the setup titled **NORMAL**. You place setups in the fixed Quick-Start Menu by moving them above the double dotted line on your Extended Menu.

Let's say we want the **S.SCAN.ABC** setup to be in the fixed Quick-Start Menu.

2. Move the cursor to the S.SCAN.ABC setup.

3. Press **CONTROL-R**. This means:

- If you are using the Apple keyboard, hold down the **CONTROL** key and press the **R** key.
- If you are using an **AFC** input method, select **CONTROL** and **R** in sequence.

4. Use the **UP ARROW** to move the setup above the double dotted line. For this demo, move the setup to the very top of the menu, above the word **NORMAL**.

5. Press **RETURN**.

The disk drive light will go on, because the changes you made are automatically saved on the disk.

6. To confirm that you really have moved a setup to the fixed Quick-Start Menu,

(1) Turn the computer **OFF**. Wait 30 seconds.

(2) Make sure the **AFC** is **ON**. Turn the computer **ON** — you should see the **S.Scan.ABC** setup, marked with an asterisk, at the top of the Quick-Start Menu. This setup is now in the #1 position on the Extended Menu *and* the fixed Quick-Start Menu. It will remain in that position until you use **CONTROL-R** again to move (rearrange) the setup to a different place.

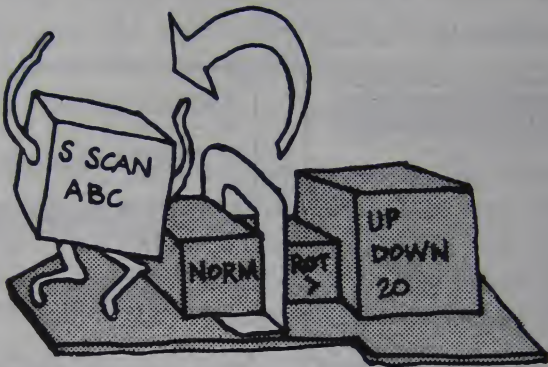
EXTENDED MENU OF AFC SETUPS		
S.Scan.ABC		
Normal		
.....		
.....		
.....		
S.Scan.ABC		
.....		
.....		
.....		

AFC Menu Disk

AFC QUICK-START MENU	

SETUPS AVAILABLE ON THIS CARD:	
*S.SCAN.ABC	REGULAR SCAN
*NORMAL	NORMAL
ROTATING >	REGULAR SCAN
UP DOWN 20	REGULAR SCAN

Adaptive Firmware Card



This #1 position is, in fact, a powerful position, as described on the next page.

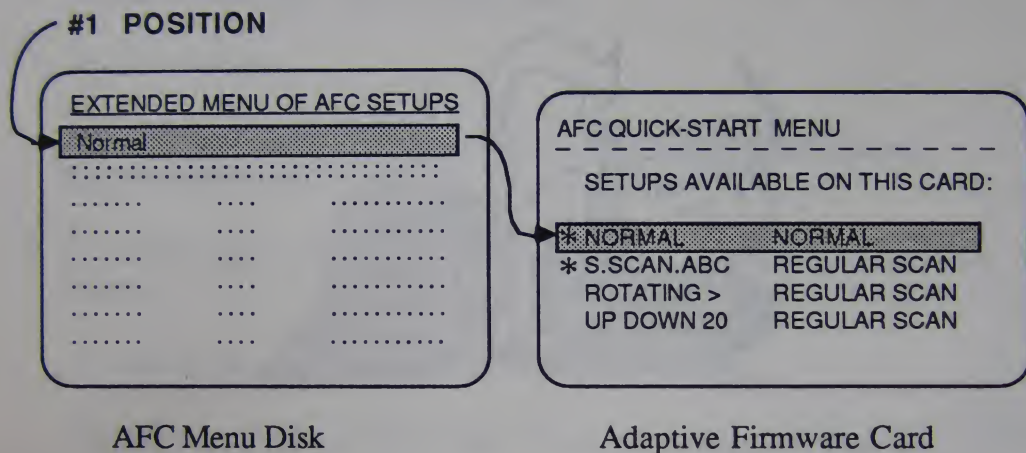
Summary: Adding a setup to the fixed Quick-Start Menu:

1. Boot the Menu Disk.
2. Move the cursor to the setup you want to move.
3. Press CONTROL-R, then use ARROWS to move the setup above the double dotted line.
4. Press RETURN.

THE POWER OF THE #1 POSITION

Having an appropriate setup in the #1 position can be very important for AFC users who want access to the computer as soon as it is turned on and who want independence in using the Menu and Construction Disk.

The setup in the #1 position is immediately active when you turn on the computer and is active whenever you use the Menu and Construction Disk.



To demonstrate the immediate effectiveness of the #1 setup, let's try using the computer now that you have moved (on the preceding pages) the S.Scan.ABC setup to the #1 position.

1. **Turn the computer OFF. Wait 30 seconds.**
2. **Make sure the AFC is ON.**
3. **Turn the computer ON** — you should see the S.Scan.ABC setup at the top of the Quick-Start Menu.
4. **Press your switch (or the OPEN-APPLE key).** The standard ABC scanning array will appear at the bottom of the screen.
5. **Press the switch when the cursor is on any empty space in the scanning line.** That selects SPACEBAR, so the cursor on the Quick-Start Menu will move down one item.

This demonstrates that the setup in the #1 position on the Quick-Start Menu is immediately active when you first turn on the computer. If the S.Scan.ABC setup were your preferred setup, you would be able to use it to select any setup from the Quick-Start Menu and to send RETURN to boot your application disk.

This same setup will also be the active setup whenever you use the AFC Menu and Construction Disk. This means you could use the S.Scan.ABC setup to move through the Extended Menu, load or make changes in setups, or to create entirely new setups.

6. If you do not want to leave the S.Scan.ABC setup in the #1 position, boot the Menu Disk, move the cursor to the S.Scan.ABC setup, and use CONTROL-R to move the setup to any position below the #1 position.

In a multi-user setting, we suggest keeping the setup titled NORMAL in the #1 position on the Extended Menu. The input method in this setup is normal-input, that is, the Apple keyboard. This will avoid the possible confusion of scanning, Morse code, or any other AFC input method being active when the computer is first turned on or when the Menu and Construction Disk is in use.

In a single-user situation, we recommend moving your own preferred setup to the #1 position. For full-access independent AFC users, this will very likely be the "S" setup for your input method. (See the chapter for your input method in Part II of this manual.)

PARTLY FIXED AND PARTLY TEMPORARY

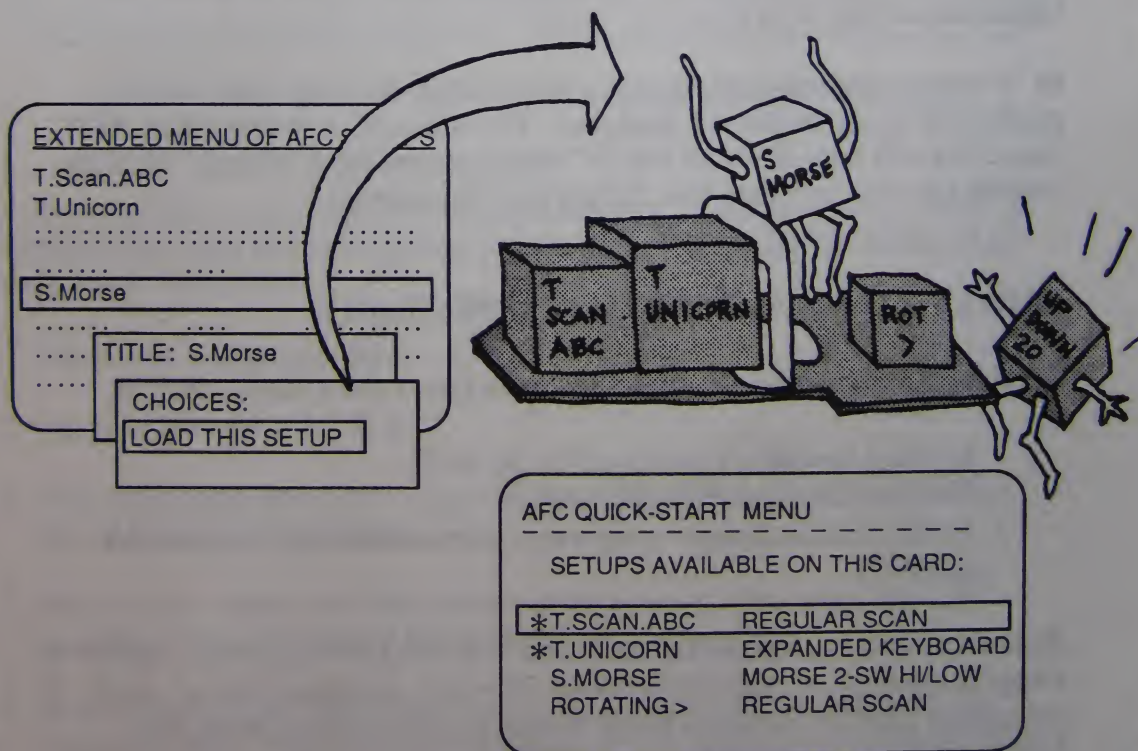
Depending on how you use your AFC, your Quick-Start Menu could be

- Entirely temporary (managed by the AFC)
- Entirely fixed (managed by you)
- Partly fixed and partly temporary (portions managed by you and the AFC)

Regardless of how the Quick-Start Menu is divided, the maximum number of setups is the same as described earlier: 20 setups, provided they are small. In the case of a partly fixed and partly temporary Quick-Start Menu, the following rules apply:

- (1) The setups in the fixed area will always be marked with an asterisk and listed first on the Quick-Start Menu — they will be arranged in the same order that you give them above the double dotted line on the Extended Menu.
- (2) The AFC will use whatever space remains for the temporary Quick-Start Menu. The setups in the temporary area will not have asterisks and will always be listed last on the Quick-Start Menu, following the fixed setups, with the least recently used setup as the last on the menu. The oldest setups on the temporary Quick-Start Menu that will be the first ones moved out when more room is needed.

In the drawing below, two setups have been placed above the dotted line on the Extended Menu. In this drawing, we'll say the AFC has limited room in the temporary Quick-Start Menu. If you try to load a new setup, as shown below, the AFC will move out the oldest setups from the temporary area and will store the new setup at the start of the temporary area.



If you want certain setups to stay on the Quick-Start Menu all the time, you should move them to the fixed area of the Quick-Start Menu, as described earlier in this chapter.

If the setup you want to load needs more room than is available in the temporary Quick-Start Menu, the AFC will mark that setup with a plus sign ('+') and will *temporarily* bump out setups in the fixed Quick-Start Menu. A plus sign, therefore, means fixed setups have been temporarily removed. The next time you boot your Menu Disk, the original fixed Quick-Start Menu will be restored to the AFC.

To make more room on the Quick-Start Menu, try removing setups from the fixed Quick-Start Menu, as described below.

REMOVING AND REARRANGING SETUPS ON THE FIXED QUICK-START MENU

To remove a setup from the fixed Quick-Start Menu, boot the Menu Disk, move the cursor to the setup, and use CONTROL-R to **R**earrange the setup to a location below the double dotted line on the Extended Menu. Moving the setup below the double dotted line removes it from the fixed Quick-Start Menu but keeps it on the Extended Menu.

*You could also use CONTROL-D to **D**elete the setup, but this would permanently remove the setup from the Menu Disk. (See "Deleting a Setup," Chapter 6.)*

To rearrange the order of setups on the fixed Quick-Start Menu, boot the Menu Disk and use CONTROL-R to **R**earrange the setups in the order that you want them. Remember that any setups you want on the fixed Quick-Start Menu must be above the dotted line on the Extended Menu.

Changes that you make with CONTROL-R will automatically be saved on the Menu Disk.

CLEARING OUT THE TEMPORARY QUICK-START MENU

As you add setups to the fixed Quick-Start Menu, the AFC will automatically remove setups, as needed, from the temporary area. If you ever want to clear out the temporary Quick-Start Menu yourself, you may do so in the following way:

1. Boot the Menu Disk.
2. Press '9' (or use SPACEBAR or ARROWS) to move to the end of the Extended Menu.
3. Move the cursor to OTHER OPTIONS at the end of the menu; press RETURN.
A window of choices will appear.
4. Move the cursor to CLEAR QUICK-START MENU; press RETURN.
A caution window will appear.
5. Respond 'Y' to the caution window.
The temporary Quick-Start Menu will be cleared, and the changes will be automatically saved to disk.

To see if this worked, you may:

1. Turn the computer OFF. Wait 30 seconds.
2. Turn the AFC and the computer ON — the Quick-Start Menu will consist only of setups which are in the fixed Quick-Start Menu (above the double dotted line on your Extended Menu).

GETTING TO THE QUICK-START MENU WHILE THE COMPUTER IS ON

You do not need to start with the computer turned off to get to the Quick-Start Menu. You can use CONTROL-A 0, which will bring up the full menu and cause the application disk to reboot after you select a setup. Or you can use CONTROL-A 4, which shows four lines of the Quick-Start Menu at a time and does *not* reboot the disk after you select a setup. Both of these options are discussed in the next part of this chapter, "Quick and Easy Changes: the CONTROL-A functions."

Summary of the Quick-Start Menu

The Quick-Start Menu is a list of setups which are *on the card itself*. This menu lets you *start more quickly* than the Extended Menu, because you don't have to boot a special disk, such as the Menu Disk, to active a setup.

To use the Quick-Start Menu:

1. Place application disk in the drive. Connect input device. Turn AFC on.
 2. Turn computer on. Quick-Start Menu appears.
 3. Select desired setup. Disk boots — and you're in business.
-

How setups get on the Quick-Start Menu:

Setups are added whenever you load and use a setup from the Extended Menu on the Menu Disk. These setups are automatically removed from the Quick-Start Menu as room is needed. If you want certain setups to stay on the Quick-Start Menu all the time, you can add them to the *fixed* portion of the Quick-Start Menu:

1. Boot the Menu Disk.
 2. Move the cursor to the setup you want to move.
 3. Press CONTROL-R, then use ARROWS to move the setup above the double-dotted line.
 4. Press RETURN.
-

Power of the #1 position:

The setup in the #1 position above the double-dotted line on the Extended Menu is immediately active when you turn on the computer and is active whenever you use the Menu and Construction Disk. Use CONTROL-R to move setups to or from this position.

QUICK AND EASY CHANGES: THE CONTROL-A FUNCTIONS

You have seen that the Quick-Start Menu allows you to activate certain setups *without using the Menu Disk*. You can also perform several other functions quickly and easily without using the Menu Disk:

- **You can check and make changes in the method, rate, or special options in a setup while using an application — without using the Menu Disk and without losing your application program.**
- **You can get back to the Quick-Start Menu without turning the computer off.**
- **You can select a new setup from the Quick-Start Menu while using an application program, without losing the program.**
- **You can change levels in a overlay (or branch to different arrays in a scanning overlay) from the Apple keyboard.**
- **You can bring up a communication window and then use the current setup to communicate with another person. This does not affect your application program.**

The way you can perform these functions is through the Adaptive Firmware Card CONTROL-A functions. The remainder of this chapter provides information about each CONTROL-A function. A summary is available at the end of this chapter.

CONTROL-A 1: Checking or Changing Method and Rate While Using An Application

When using the AFC with an application program, you can use CONTROL-A 1 to bring up the method/rate window. This window allows you to check or make changes in the AFC method or rate while using your application program. This can be useful in such situations as:

- You are using your usual AFC setup, but you're not feeling up to par — perhaps your most comfortable chair is in disrepair, or you're just recovering from a bout with the flu. You'd like to slow down your AFC rate to make things more comfortable. (Or you're feeling zippy and would like to try a faster rate than usual.)
- You are trying to help a client decide which AFC method and rate to use. You want to be able to experiment with the rate or the different variations of a method while using a particular application program.
- Your input device is not responding correctly. You want to quickly check the AFC method and rate, to be sure they are set correctly, without starting all over.

In any of these situations, CONTROL-A 1 can be helpful.

1. To use CONTROL-A 1:

- If you are using the Apple keyboard, hold down the CONTROL key, then press the A key, then *release both keys*. (Nothing will happen.) Then touch the number 1.
- If you are using an AFC input method, select CONTROL, then the letter A, then the number 1, *in that sequence*. (Nothing will happen until you select the number 1.)

2. The method/rate window will appear on the lower portion of the screen, similar to the one shown on the next page. This tells you the method and rate and title of the setup.

- If you do not want to make changes, press ESC to exit the window and resume your application program.

- If you want to make changes in the method and/or rate, follow the steps below.

METHOD: Name of method	Use arrows
RATE: Number for rate	+ Return
TITLE: Name of setup	to select
	ESC = done

3. The cursor will be on METHOD. To change the method, press RETURN.

METHODS AVAILABLE:	Use arrows
VARIATION A	+ Return
VARIATION B	to select
VARIATION C	ESC = done

4. Method variations will be listed. Example: Scanning will allow scrolling though 4 variations; expanded keyboard has only one. Move the cursor to the desired method; press RETURN.

METHOD: Name of method	Use arrows
RATE: Number for rate	+ Return
TITLE: Name of setup	to select
	ESC = done

5. You will return to the first window. To change the rate, move the cursor to RATE, then press RETURN.

RATE	PRESENTLY = #
------	---------------

6. Press the number for the new rate, then press RETURN.

ENTER NEW VALUE (0-29)

METHOD: Name of method	Use arrows
RATE: Number for rate	+ Return
TITLE: Name of setup	to select
	ESC = done

7. If the method and rate are as you want them, press ESC to exit. If these are not as you want them, move the cursor and press RETURN to change, as described above.

The changes you make affect only the copy of the setup that is on your AFC. To permanently save these changes in the setup on your Menu Disk, wait until you are finished with the application program, then use CONTROL-A 3 to save the changes on the Menu Disk. (See page 4-25.)

CONTROL-A 2: Checking or Changing Special Options While Using an Application

When using the AFC with an application program, you can use CONTROL-A 2 to bring up the the special options window. This window allows you to check or change the settings of *certain* AFC "special options" while using your application program. (*Special options will be discussed in Chapter 5.*) This can be useful in such situations as:

- You are using a timed program which moves too quickly, even at the slowest setting within the program. You would like to try out different settings for AFC SLOWDOWN while running this program.
- You are using the AFC REPEAT function with an application, and you would like to experiment with different REPEAT RATES to find the one which works best for you with this application.
- You are using AFC scanning, but the array (the scanning line) is blocking an important part of the screen. You would like to try out different positions for the scan line while using the program.

In any of these situations, CONTROL-A 2 allows you to adjust certain special options and to immediately see the result in the application program.

Note: Not all special options are adjustable with CONTROL-A 2. This will be explained in Chapter 5.

1. To use CONTROL-A 2:

- If you are using the Apple keyboard, hold down the CONTROL key, then press the A key, then *release both keys*. (Nothing will happen.) Then touch the number 2.
- If you are using an AFC input method, select CONTROL, then the letter A, then the number 2, *in that sequence*. (Nothing will happen until you select the number 2.)

2. **The special options window will appear** on the lower portion of the screen, similar to the one shown on the next page. This tells you the settings for *certain* AFC special options in this setup.

- If you do not want to make changes, press ESC to exit the window and resume your application program.
- If you want to make changes in the special option settings, follow the steps below.

For a description of AFC special options, see Chapter 5.

SPECIAL OPTIONS:		Use arrows
SLOWDOWN	= 0	+ Return
REPEAT RATE	= 0	to select
REPEAT METHOD	= 0	ESC = done
(scroll to other options)		

3. Move the cursor down to scroll through what may be a long list of special options. (These vary with each setup.) When the cursor is on the option you want to change, press RETURN.

(Name of Option) PRESENTLY = #

4. Press the number for the new setting, then RETURN.

ENTER NEW VALUE (0-##)

SPECIAL OPTIONS:		Use arrows
SLOWDOWN	= 20	+ Return
REPEAT RATE	= 0	to select
REPEAT METHOD	= 0	ESC = done

5. The new setting will be displayed. You may continue to change the settings for other options shown in the window. To exit the window, press ESC.

For a description of the various special options, see Chapter 5.

The changes you make affect only the copy of the setup that is on your AFC. To permanently save these changes in the setup on your Menu Disk, wait until you are finished with the application program, then use CONTROL-A 3 to save the changes on the Menu Disk. (See page 4-25.)

CONTROL-A 3: Saving CONTROL-A Changes on the Menu Disk

When you make changes in a setup using CONTROL-A 1 (for method/rate) or CONTROL-A 2 (for special options), the changes affect only the copy of the setup that is on your AFC. You can use CONTROL-A 3 to "back up" these changes in the copy of the setup that is on your Menu Disk.

1. **To back up your changes, wait until you ready to quit the application program, and before you boot another disk or turn off the computer.**
2. **Press CONTROL-A 3:**
 - If you are using the Apple keyboard, hold down the CONTROL key, then press the A key, then *release both keys*. (Nothing will happen.) Then touch the number 3.
 - If you are using an AFC input method, select CONTROL, then the letter A, then the number 3, *in that sequence*. (Nothing will happen until you select the number 3.)
3. **KEEP PRESENT SETUP? (Y/N) will appear at the bottom of the screen. Press Y RETURN.**
4. **The bottom of the screen will show**

PLEASE INSERT AFC MENU DISK
- PRESS <RETURN> WHEN READY
- PRESS <ESC> TO CANCEL

- **If you don't want to save the changes right now, press ESC.**
- **If you do want to save the changes, remove the application disk, insert your AFC Menu Disk, and press RETURN. The Menu Disk will boot and save the changes in that setup on the Extended Menu.**

CONTROL-A 4: Selecting a New Setup from the Quick-Start Menu Without Losing the Application Program

You can use CONTROL-A 4 to select a new setup from the Quick-Start Menu without losing your application program. This can be useful in such situations as:

- You are in a classroom setting where many children enjoy Alex the Rabbit: Joey uses scanning, Susie uses an expanded keyboard, Mark uses assisted keyboard, and Davey uses a multiple switch box. You would like a group activity, where each child takes a turn with Alex — you need a way to quickly change setups without rebooting Alex the Rabbit.
- You frequently use AFC MACROS with your word processing program. You have different setups with different macros, such as one setup with macros for business letters and another setup with macros for personal letters. When using your word processor, you would like to easily switch between these setups, depending on the macros you want to use. (Macros are described in Chapter 17.)

1. **Press CONTROL-A 4.** The setups available window will appear on the lower portion of the screen, similar to the one shown below.

SETUPS AVAILABLE:	Use arrows
*NORMAL	+ Return
S.SCAN.ABC	to select
UPDOWN	ESC = done
(scroll to other setups)	

Up to 20 setups may be available — as you move the cursor down, more titles will move up.

2. **Move the cursor to the setup you want; press RETURN.** (To exit without selecting a new setup, press ESC.)
3. The screen will return to the application program, and the new setup will be active. **Use the new setup to run the application program.**

Hint: In a multi-user situation, you can prepare different fixed Quick-Start Menus on different disks. Then, to transfer a new Quick-Start Menu to an AFC, just boot that Menu Disk with the AFC turned off. For information on moving setups to the fixed Quick-Start Menu, see page 4-11.

CONTROL-A 0:

Selecting a New Setup from the Quick-Start Menu And Rebooting the Application Disk

You can use CONTROL-A 0 to bring up the full-screen Quick-Start Menu — when you select a setup from the full-screen Quick-Start Menu, your application disk will *automatically reboot*. This can be useful if you have been using the computer and you want to start over with a different AFC setup *and* a different application disk.

Using CONTROL-A 0 clears out the present application program, just as if you had turned the computer off.

Using CONTROL-A 0 is quicker than turning the computer off then turning it back on, because you should normally wait at least 30 seconds after turning the computer off before you turn it back on.

1. To use CONTROL-A 0:

- If you are using the Apple keyboard, hold down the CONTROL key, then press the A key, then *release both keys*. (Nothing will happen.) Then touch the number 0.
- If you are using an AFC input method, select CONTROL, then the letter A, then the number 0, *in that sequence*. (Nothing will happen until you select the number 0.)

2. The Quick-Start Menu will appear on the screen. **Decide which setup you want to use.**

3. **Put the new application disk in the drive.**

4. **Move the cursor to your setup, then press RETURN.** The application disk will boot.

5. **Use the new setup to run the new application program.**

Hint: If you want to select a new setup *without* rebooting the application disk, use CONTROL-A 4. (See page 4-26.)

CONTROL-A 5: Checking or Changing Levels or Arrays from the Apple Keyboard

A helper or trainer can press CONTROL-A 5 on the Apple keyboard to check the level number or shift between levels in a multi-level overlay. (Levels are described in Chapter 7.) Using the keyboard to shift between levels can be useful in situations such as the following:

- You are training a very young child to use a two-half overlay for the Unicorn Expanded Keyboard. You have a different paper overlay for each of several levels. (See the TAG Sampler example in "Planning Levels," Chapter 7.) You don't want to use a square on the overlay to store an AFC.LEVEL command, so you need to be able to shift levels using the Apple keyboard.
- You have developed a multi-level overlay for training Morse code. In Level 1, you have codes for 5 letters — all other codes are null. In Level 2, you have codes for 10 letters, etc. To avoid accidental shifting between levels, you have not put AFC.LEVEL codes in the overlay. Instead, you want the trainer to use the Apple keyboard to shift to new levels, as needed.

1. **Press CONTROL-A 5.** The bottom of the screen will show:

LEVEL	PRESENTLY = #
-------	---------------

ENTER NEW VALUE (0-##)

2. • If you don't want to change levels, press ESC to exit.
- If you do want to change levels, enter the number of the new level, then press RETURN. The screen will return to the application program, and you can use the new level of your overlay to run the program.

If a scanning overlay has more than one array, you can use CONTROL-A 5 from the Apple keyboard to check or shift between the levels (arrays).

CONTROL-A 6: Using the Communication Window

Suppose, in the middle of using an application, you would like to be able to use the AFC to communicate with another person, such as to ask a helper "Please check the paper," or perhaps to chat with a friend who just came in. **When using the AFC with an application program, you can use CONTROL-A 6 to bring up the communication window.** This window lets you use your AFC setup to communicate with another person — without affecting your application program.

1. **Press CONTROL-A 6.** The communication window will appear at the bottom of the screen.

COMMUNICATION WINDOW ESC = done

2. **Use your active AFC setup to send temporary text to this window.**

Keep in mind that the communication window is not a word processor — you can't save or edit text. It's designed for on-line communication only. Some tips are:

- Don't worry about text getting divided at the end of the line — anyone reading the word will figure it out, even if it's divided.
- To backspace, use LEFT ARROW or DELETE.
- To clear the window and start a new message, press RETURN a few times.
- If you fill up the window, a soft tone will warn you that the communication window will clear on the next character.

3. **To exit the communication window, press ESC.** The screen will return to your application program.

Note: For independent use of this window, the overlay in your setup must include CONTROL-A 6 (as separate items or as one item) and ESC, as well as characters or words for communication.

CONTROL-A Help

When using the AFC with an application program, you can use CONTROL-A ? to bring up the CONTROL-A help window. This window displays the numbers and title for each CONTROL-A function and lets you select any function with a moving cursor.

1. Press CONTROL-A ? (or CONTROL-A /).

- If you are using the Apple keyboard, hold down the CONTROL key, then press the A key, then *release both keys*. (Nothing will happen.) Then touch the '?' key.
- If you are using an AFC input method, select CONTROL, then the letter A, then the '?' or '/' character, *in that sequence*. (Nothing will happen until you select the '?' or '/'.)

2. The lower portion of the screen will clear, as shown below.

CTRL-A HELP:

0 = QUICK-START MENU

1 = METHOD/RATE

2 = SPECIAL OPTIONS

(scroll to other functions)

Use arrows

+ Return

to select

ESC = done

3. Move the cursor through the functions to find the number of the one you want. This will help you know the number the next time you want to use it.

4. • To use one of the CONTROL-A functions at this time, move the cursor to the function, then press RETURN. The effect will be the same as if you had used the CONTROL-A # in the usual way for all the functions except CONTROL-A 0.

Normally, using CONTROL-A 0 brings up the full-screen Quick-Start Menu and clears the application program from the computer. To avoid this happening accidentally through the CONTROL-A help window, selecting CONTROL-A 0 from the help window only brings up the setups available window, as if you had selected CONTROL-A 4.

- To exit without using one of the functions, press ESC.

CONTROL-A Fix

If pressing CONTROL-A interferes with your application program, you can use the AFC special option of CONTROL-A FIX to change the AFC command *in that setup* to some other letter, such as CONTROL-B, control-G, or CONTROL-Z, etc.

For example, in the Early Learning programs by Marblesoft, a teacher or helper uses CONTROL-A to shift the program to a higher level. In Apple Writer™ II Version 2.0 (by Apple), you use CONTROL-A to adjust the margins horizontally. With these programs, some confusion may result when you use CONTROL-A with the AFC turned on. If this occurs, one solution is to change the AFC CONTROL-A command to another letter.

This change in the AFC CONTROL-A command takes affect only when that setup is active. When any other setup is active, CONTROL-A is still the AFC command.

To change the AFC CONTROL-A command to another letter:

1. **Review your application program to decide on a CONTROL+letter combination which will not interfere with the program.** (Most programs have a listing of such commands in the manual.)
2. **Use the Make Changes window on your AFC Menu Disk to set the special option of FIX-IT KIT to ON.** The steps are:
 - (a) Boot the Menu Disk.
 - (b) Move the cursor to the setup you want to change.
 - (c) Press RETURN two times to bring up the Choices window.
 - (d) Select MAKE CHANGES IN SETUP.
 - (e) Select SPECIAL OPTIONS. Respond 'Y' to the caution window.
 - (f) Move the cursor to FIX-IT KIT. If this is marked ON, skip ahead to step 3, below. If FIX-IT KIT is marked OFF, press RETURN for a description.
 - (g) Press RETURN again to change the setting.
 - (h) Press the number 1, then RETURN, to change the setting to ON.

```

TITLE: Sample
SPECIAL OPTIONS:
FIX-IT KIT      = <ON>
| DISPLAY FIX   = <OFF>
| DISK FIX      = <OFF>
(scroll for more)

```

When the special options list reappears, you'll see various fixes displayed under FIX-IT KIT. (This list appears only when FIX-IT KIT is ON. It will disappear if you turn FIX-IT KIT off. You can only turn FIX IT KIT on or off from the Make Changes window.)

3. Set CTRL-A FIX to the new letter. The steps are:

- (a) Move the cursor down until it is on CTRL-A FIX; press RETURN for a description.

```

TITLE: Sample
SPECIAL OPTIONS
OPTION: | CTRL-A FIX
PRESENTLY= <OFF>
Substitutes another letter
for A in the CTRL-A options
ie, if 2, use CTRL-B instead

RETURN=CHANGE      ESC=EXIT

```

- (b) Press RETURN again to change the setting.

```

TITLE: Sample
SPECIAL OPTIONS
OPTION: | CTRL-A FIX
PRESENTLY= <OFF>
RANGE: (1-26)

ENTER NEW SETTING =>

```

- (c) To enter the new setting, first convert the *letter* you want to the number which represents its position in the alphabet, ie. A=1, B=2, C=3, Y=25, Z=26, etc.

Enter the number for the new letter, then press RETURN.

- (d) To exit the list of special options, press ESC. The changes will be saved on the disk.

4. Load the setup and use it with your application program.

Remember — for AFC CONTROL-A functions, you must use CONTROL + your new letter, instead of A, whenever this setup is active.

Summary of CONTROL-A Functions

Use CONTROL-A ?	to get a HELP listing of all CONTROL-A functions, arranged by number
Use CONTROL-A 1	to check or change method or rate while using an application program
Use CONTROL-A 2	to check or change special options while using an application program
Use CONTROL-A 3	to save the above changes in the copy of the setup on your Menu Disk – do this when you are done with the application program
Use CONTROL-A 4	to select a new setup from the Quick-Start Menu without losing the application program
Use CONTROL-A 0	to bring up the Quick-Start Menu, select a new setup, and boot a new application disk
Use CONTROL-A 5	to change levels in an overlay or arrays in a scanning overlay from the Apple keyboard
Use CONTROL-A 6	to bring up the communication window and send a message without losing the application program

Procedure for using an AFC CONTROL-A function:

- If you are using the Apple keyboard, hold down the CONTROL key, then press the A key, then *release both keys*. (Nothing will happen.) Then touch the number key for that function.
- If you are using an AFC input method, select CONTROL, then the letter A, then the number for that function, *in that sequence*. (Nothing will happen until you select the number.)

CHAPTER 5

USING SPECIAL OPTIONS, SUCH AS SLOWDOWN

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CHAPTER 5

USING SPECIAL OPTIONS, SUCH AS SLOWDOWN

AFC SPECIAL OPTIONS allow special adjustments of the AFC which may be needed with certain application programs. Many of these options apply only to setups with certain characters in the overlay (such as CAPS LOCK, AFC.REPEAT, or AFC.MACRO) or to programs using pointing devices, such as the mouse, joystick, or paddles. Three special options — SLOWDOWN, CLICK FEEDBACK, and the FIX-IT KIT — apply to all setups. The special option of SLOWDOWN is of particular interest, because it can be used to slow down any interactive application program.

This chapter will give an overview of all the AFC special options, along with basic information on how to make changes in the special option settings. The last part of the chapter will discuss SLOWDOWN in some detail and will outline a SLOWDOWN demo to encourage you to practice using and changing the SLOWDOWN setting. Special options other than SLOWDOWN will be discussed in detail in other chapters.

WHAT ARE THE SPECIAL OPTIONS?

The components of an AFC setup are: method, rate, overlay, special options, and, in some cases, macros. The method, rate, and overlay are the most basic components — in the same way that the channel and the volume are the basic settings when you use the television. In most cases, using these basic components is all you need to do to use an AFC setup (or to watch your TV program).

In some cases, however, it may be necessary to do some additional special adjustments. With a television, you occasionally need to adjust the contrast, brightness, color, or vertical hold buttons. When you use the AFC with certain application programs, you may need to adjust some SPECIAL OPTIONS in order for the AFC and the application program to work together properly.

The following list describes the AFC special options in System Software 4.0 for the AFC Model G32 in the Apple IIGS. SLOWDOWN will be discussed in detail later in this chapter.

SLOWDOWN	May be used to make any interactive program run more slowly. 0 = no slowdown, 255 = maximum slowdown. See demo in this chapter.
SCAN SIZE	Determines size of characters in scanning array. 0 = normal text, 1 = medium scan characters, 2 = large scanning characters. With scan size = 2, the scanning array will be 20-column size when used with a full-screen graphics application, such as Alex the Rabbit, Dr. Peet's Talk/Writer, 20-column Magic Slate, Talking Text Writer™, Reader Rabbit™, Stickybear programs, and most of the Marblesoft programs. The scan will not be large in an AFC test window or with an application program using regular text or lo-resolution graphics. This option does not appear if scanning is not the input method. See SCANNING chapter.
SCAN LINE	Specifies location on the screen of the scanning line. 0 = top line, 23 = bottom line. This option does not appear if scanning is not the input method. See SCANNING chapter.
CLICK FEEDBACK	Adds or removes auditory click as feedback for the input method. 0 = off, 1 = on. For Morse code and scanning, it is possible to connect headphones or a speaker to the I/O box to obtain auditory feedback when CLICK FEEDBACK is off. See Appendix E.
REPEAT METHOD	Lets you set the way in which the AFC REPEAT works in scanning. 0 = you select the REPEAT character, then hold the switch down to keep repeating (similar to inverse scanning); to quit repeat mode, release the switch and wait. 1 = you select the REPEAT character, then press the switch to start the repeat, press the switch again to stop it (similar to regular scanning); to quit repeat mode, stop the repeat and wait. This option appears only if the method is scanning; it will not appear if the scanning overlay does not include the AFC.REPEAT character. (For information about REPEAT, see the SCANNING chapter.)
REPEAT RATE	Lets you adjust the rate of the AFC REPEAT without affecting the rate of your input method. 0 = slowest repeat rate, 29 = fastest repeat rate. Ordinarily, this setting will be adjusted automatically when you set the rate for the method in the setup: method rates of 1-9 will have repeat rates of 1-9, respectively; rates of 10-29 will have a repeat rate of 10. The REPEAT RATE option does not appear if the overlay does not include the AFC.REPEAT character. (See the chapter for your input method.)

**MESSAGE
RATE**

Lets you adjust the rate at which the AFC sends strings of characters, including text macros or mouse macros, to the application program. This can be useful when the macros or strings in your overlay go too fast for your program OR when you want to see the execution of the string more clearly (a useful diagnostic tool if the string isn't working properly). Adjusting this option can also be useful when a setup uses interruptible macros to move the mouse or joystick pointer through choices. 0 = slowest rate, 29 = fastest rate. This option appears only if the overlay contains strings of characters or the AFC.MACRO character. Part of demos in Chapters 17 and 18.

**SWITCH
DELAY**

Lets you enter a switch-activation delay, so that the AFC will not register a switch press until the switch has been closed for a certain delay period. Helps screen out brief accidental presses. May be useful with eye-blink switches. 0 = no delay. 255 = maximum delay.

AUTO-CAPS

When this special option is ON (set to 1), and you are sending lower-case letters, the first letter you send after a period, question mark, exclamation point or RETURN will be capitalized automatically. 0 = off, 1 = on. This option will not appear if the overlay does not include the AFC CAPS-LOCK character.

AFC.SPEECH

If the overlay in this setup was written to include speech feedback, this option allows you to turn the speech feedback on or off. 0 = off, 1 = on. This option will not appear if speech feedback is not part of the overlay.

FIX-IT KIT

Turning this on (=1) gives you a list of available problem-fixers. You can only turn this option on or off from the Make Changes window.

| **DISPLAY FIX**

Turn this on (=1) if text displayed in the AFC CONTROL-A windows is unreadable with a certain application program.

| **DISK FIX**

If an application program won't boot while the AFC is turned on (such as some programs by Broderbund), turn DISK FIX on (=1). With DISK FIX on, the AFC temporarily turns itself off while the disk drive is going, then turns itself back on when the disk has booted.

| **MODEM FIX**

Turning this on (=1) will increase the transparency of the AFC when you are using a modem, ie. the AFC will not halt the modem communications program.

| **KEY HOLD**

Determines how long a key is held down. A setting of 0 means the key (or character AFC sends) is pressed and released instantaneously, which is appropriate for most programs. However, some games (such as World Games™, by Epyx) require that you hold a key down for a certain period of time. Setting KEY

HOLD from 2 to 255 results in the key being held down for a fixed period of time. (The larger the number, the longer the time. Try 5.) Setting KEY HOLD = 1 provides a direct connection for the standard Apple keyboard when the AFC is on.

| CTRL-A FIX

Lets you to change the AFC CONTROL-A functions to some letter other than A, if, for example, using CONTROL-A interferes with the application program. Setting CTRL-A FIX to 0 or 1 means the letter is A. Setting it to 2 means the letter is B (CONTROL-B then substitutes for CONTROL-A as an AFC command). For Marblesoft programs, try setting CTRL-A FIX = 5 and use CONTROL-E for AFC commands. CTRL-A FIX can only be changed from the Make Changes window. See Chapter 4.

**AFC.
APPLEKEY**

Governs the function of COMMAND/OPEN-APPLE and OPTION/SOLID-APPLE characters and the function of switches as direct input to a program. (Similar but not identical to GAMEPLAY in the AFC-2e System Software 2.3.) 0 = latching, 1 = momentary, 2 = direct. This option will not appear if the COMMAND/OPEN-APPLE or OPTION/SOLID-APPLE characters are not part of the overlay. The setting can be changed only from the Make Changes window. See Chapter 21.

| DURATION

If APPLEKEY = 1 (momentary), the suboption for DURATION appears. This lets you specify how long the AFC should hold down the OPEN-APPLE and OPTION/SOLID-APPLE keys. 0 = short, 255 = long. See Chapter 21.

| STOPTIME

If APPLEKEY = 2 (direct), the suboption for STOPTIME appears. This lets users of switch-based methods (scanning and Morse code) mix input methods while using a switch-based program, such as a game: you set a time for resuming keyboard emulation when the switches are being used for direct (non-emulating) input. 0 = short, 255 = long. See Chapter 21.

AFC.MACROS

Turn this on (=1) to enable or off (=0) to disable the AFC Instant Message program. This option will not appear if the overlay does not include the AFC.MACRO character. The setting can be changed only from the Make Changes window. See Chapter 17.

**MOUSE/
JOYSTICK**

Turning this on (=1) lets you use this setup (method, rate, overlay, etc.) to emulate not only the Apple keyboard but a pointing device, such as the mouse, joystick, paddles, etc. This option does not appear if the AFC.MOUSE/JOYSTICK character is not part of the overlay. The setting can only be changed from the Make Changes window. For mouse emulation, see Chapter 18. For emulation of the joystick or other pointing devices, see Chapter 19.

DEVICE	Set this to the device you want to emulate. 0 = mouse, 1 = joystick, 2 = paddles. See Chapter 19.
ADJUSTMENTS	Turn this on (=1) to show or off (=0) to hide CLICK LENGTH, STEP SIZES, and the JOYSTICK ADJUSTMENT options described below. You can only turn this on/off from the Make Changes window.
CLICK LENGTH	This specifies how long the AFC should hold down the mouse button. If the program doesn't "hear" the AFC mouse click, try a longer setting. 0 = shortest, 255 = longest.
SMALL UP/DOWN	Adjusts the distance moved by the mouse/joystick pointer in its small up/down steps. 0 = smallest, 255 = largest.
	Note: All of the step sizes (small, medium, and large) may be adjusted using the step size command, 'P', while in mouse mode. See Chapter 18.
SMALL LEFT/RT	Adjusts the distance moved by the pointer in its small left/right steps. 0 = smallest, 255 = largest.
	The small steps sizes above are also used when you move the pointer smoothly by means of ARROW keys or the rotating arrow, described below. One way to make the pointer move more quickly is to increase the small up/down and small left/right step sizes. Another way is to adjust ROTATION RATE, described under ROTATING ARROW.
MED. UP/DOWN	Adjusts the distance moved by the pointer in its medium up/down steps. 0 = smallest, 255 = largest.
MED. LEFT/RT	Adjusts the distance moved by the pointer in its medium left/right steps. 0 = smallest, 255 = largest.
LARGE UP/DOWN	Adjusts the distance moved by the pointer in its large up/down steps. 0 = smallest, 255 = largest.
LARGE LEFT/RT	Adjusts the distance moved by the pointer in its large left/right steps. 0 = smallest, 255 = largest.
JOYSTK ADJUST	The two JOYSTK ADJUST options are the AFC equivalent of adjusting the two centering adjustment knobs on the joystick. When this option and the one below it are set correctly, the figure in your joystick program will be at rest. Range = 0-255. Recommended setting = 130. See Chapter 19.
JOYSTK ADJUST	This is the AFC equivalent of joystick adjustment knob #2. Range = 0-255. Recommended setting = 130. See Chapter 19.
ROTATING ARROW	Turning this on (=1) means you can use SPACEBAR in mouse/joystick mode to bring up a ROTATING ARROW. The rotating arrow lets you move the mouse/joystick pointer smoothly in the direction shown by the arrow. You also need this option on to make adjustments in method or rate for smooth-movement

ARROW keys. The setting can be changed only from the Make Changes window.

METHOD	Lets you set the method you use to interact with ARROW keys <i>or</i> the rotating arrow. 0 = hold the switch or key down to keep the mouse/ joystick pointer continuously moving in the direction of the arrow. 1 = you press the switch/key to start the pointer moving, press the switch/key again to stop it.
RATE	Lets you adjust the rate of the rotating arrow and the rate of smooth pointer movement (for the ARROW keys <i>or</i> rotating arrow) without changing the rate of the input method. 0 = slowest rate, 29 = fastest rate. The rate of smooth pointer movement is also affected by the small step size, described under mouse/joystick adjustments, above.
LOCATION	Lets you place the rotating arrow in any of 8 locations around the edge of the screen. 0 = lower left corner, 1 = low center, 2 = lower right corner, 3 = right side center, etc.
DISPLAY MODE	Lets you to adjust the appearance of the rotating arrow. 1 = normal display mode, 2 = large rotating arrow, 3, 4 = alternate display modes.
DIRECTIONS	Lets you select the directions covered by the rotating arrow. 0 = left/right only, 1 = up/down only, 2 = four directions.
BUTTONS	Lets you set the button choices included with the rotating arrow. 0 = X (exit), C (click). 1 = X, C, C2 (click 2nd joystick button). 2 = X, C, B (hold button down). 3 = X, C, B, * (double-click).

Making Changes in Special Options

Each special option works by means of a range of settings. For the on/off options, the setting are 0 = off, 1 = on. For other options, the settings can range from 0-2 to 0-255. Every setup contains special options set to their default settings. To get information about the special options in a setup on the Extended Menu, follow the steps described in "Get More Information ... Special Options," Chapter 6. In brief, the steps are:

- (1) Select the setup.
- (2) Bring up the Choices window
- (3) Select GET MORE INFORMATION.
- (4) When the next menu appears, select SPECIAL OPTIONS.

The menu of special options will show you the settings for each option in that setup. From there, you can press RETURN to get more information about the option or press ESC to return to the Choices window.

If you want to check or change the special option settings, two procedures are available: you can use the Make Changes window on the Menu Disk, described in Chapter 6, to change *any* special option setting, or you can use CONTROL-A 2, described in Chapter 4 to change the setting for *certain* options. Each procedure has its own advantages. The highlights of these two procedures are summarized in Figure 5-1.

Figure 5-1. Highlights of Procedures for Changing Special Options.

<u>Procedure</u>	<u>Advantages</u>	<u>Results</u>	<u>Reference</u>
Use CONTROL-A 2 while using the setup with an application program.	Lets you experiment with certain special option settings and immediately see their effect in the application program.	Changes are saved in the copy of your setup that is on the AFC. To also save the changes in the setup on the Menu Disk, use CONTROL-A 3 and put in the Menu Disk when prompted.	Chapter 4
Use the Menu Disk: select MAKE CHANGES from the Choices window, then select SPECIAL OPTIONS from the Make Changes window.	Lets you change the setting of any special option. Descriptions and help windows are provided as you go along.	Changes are automatically saved on the Menu Disk.	Chapter 6

LEARNING ABOUT SLOWDOWN

The SLOWDOWN option can be used to make any interactive program run more slowly. This may be useful with a timed drill or arcade-type game or any program which moves too quickly to be comfortable.

The range of settings for SLOWDOWN is 0 to 255. A SLOWDOWN setting of zero means no deliberate SLOWDOWN. (The AFC, when it is turned on, will have a minor slowing down effect on almost any program, but usually this effect is not noticeable.) A setting higher than zero means that the AFC is deliberately slowing down the program to some extent — the higher the number, the greater the SLOWDOWN. The maximum SLOWDOWN is 255.

How much a certain SLOWDOWN setting affects an application program will depend on that program. You may find that you want a SLOWDOWN of 20 in one program and a SLOWDOWN of 100 in another.

If you would like to slow down a program, you might try a moderate SLOWDOWN and experiment from there. You can experiment while using the application program, as described in the demo below.

SLOWDOWN Demo

This demo will show you how SLOWDOWN works, how you can change the SLOWDOWN setting while using an application program, and how you can permanently add a SLOWDOWN factor to a setup on your Menu Disk. The demo also shows you how to copy a setup, how to delete a setup, and how to change the title or description of a setup.

USING THE APPLICATION PROGRAM: COLORS/TONES

Colors/Tones, on your Sample Application Software Disk, is an example of a program which is useful as is but which may be even more useful when you slow it down. (This program is a modified version of the Colors/Tones available on the Motor Training Games disk, used with permission of the author.)

Colors/Tones happens to be a switch-input program, requiring a single switch (or the OPEN-APPLE key).

1. **Boot the AFC Menu Disk, load the SW INPUT setup, then put in the Sample Application Software Disk, press RETURN, and select Colors/Tones.**
2. **When Colors/Tones has been loaded, press and hold down switch #1 or the OPEN-APPLE key. While you hold the switch closed, the colors and tones rapidly change.**

This is a very simple motor training game, a cause-and-effect program for a young or severely physically involved person who is just learning/practicing switch closure. While there are no time pressures in this program (you don't need to do anything by a certain time), some advantages might be gained by slowing it down. For example, if the colors moved more slowly, you might be able to make a game out of trying to make the program stop on a certain color.

EXPLORING SLOWDOWN

3. **Use CONTROL-A 2 to try different SLOWDOWN settings with this application program. Make a note of the SLOWDOWN setting which you like best with this program.**

For help using CONTROL-A 2, see Chapter 4.

MAKING CHANGES ON THE MENU DISK

The changes you make using CONTROL-A 2 are automatically saved in the copy of the setup that is now on the AFC. They are not automatically saved in the copy of the setup that is on the Menu Disk. What if you would like a setup on the Menu Disk to permanently include the SLOWDOWN you want for a particular program? One way to do this is to use the Make Changes window on the Extended Menu.

We will next be making permanent changes in a setup. Since you may want to use the SW INPUT setup on other occasions without SLOWDOWN, let's first make a copy of the SW INPUT setup, then make changes to the copy.

4. **Copy the SW INPUT setup.** To do this,

- (1) Boot the Menu Disk.
- (2) Move the cursor to the SW INPUT setup.
- (3) Use CONTROL-C to Copy the setup.

5. Move the cursor to the second SW INPUT setup. **Select MAKE CHANGES. Use the Make Changes window to change SLOWDOWN in this setup.** Changes will automatically be saved on the Menu Disk.

For help using the Make Changes window, see Chapter 6.

6. Load and use the revised setup to confirm that the SLOWDOWN you selected is there.

COMBINING EXPERIMENTING (CONTROL-A 2) WITH SAVING ON DISK (CONTROL-A 3)

7. While you are running the Colors/Tones program, **use CONTROL-A 2 to change the SLOWDOWN slightly.** Check out this change by continuing to use Colors/Tones.
8. **When you are done, use CONTROL-A 3.** Put in the Menu Disk and press RETURN when directed to do so. **Using CONTROL-A 3 saves the changes you made with CONTROL-A 2 to the copy of the setup on the Extended Menu.**

To learn more about CONTROL-A 3, see Chapter 4.

RENAMING OR DELETING A SETUP

You now have two SW INPUT setups on your Extended Menu, one with SLOWDOWN = 0 and one with SLOWDOWN = your setting for Color/Tones.

- If you plan to keep the SW INPUT with SLOWDOWN setup, you might want to change its title and description to indicate it is for Colors/Tones and that it includes SLOWDOWN. To change the title and/or description, use the Make Changes window.

For help changing the title or description, see "Make Changes ... Description," Chapter 6.

- If you do not want to keep the new setup, you may delete it. Move the cursor to the setup, then use CONTROL-D to Delete.

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CHAPTER 6

REFERENCE: THE MENU DISK

So far, you have had a brief summary of the capabilities of the AFC Menu Disk and have been using various Menu Disk options in step-by-step demonstrations (Chapters 1-5). This reference chapter provides information on each Menu Disk function, including functions you have already used as well as functions not previously discussed.

Capabilities of the Menu Disk

Using the AFC Menu Disk, you may do the following:

- initialize the AFC with System Software 4.0 (this happens automatically)
- move through the Extended Menu of up to 100 different setups
- obtain descriptions of each setup
- load and test a given setup
- load and use a setup
- get more information about a setup, including particulars about method and rate, special options, overlay, macros, and vital statistics (size of the setup, levels in the overlay, and the status of speech feedback, macros, and mouse emulation capabilities)

In addition, you may:

- make changes in a setup, including changes in
 - description
 - method and rate
 - special options
 - overlay
 - macros
- add new setups
- delete setups
- copy setups
- rearrange setups

- simplify the appearance of the Extended Menu
- make other changes which pertain to how the AFC functions in general

Also, at any time, you can

- get help (the '?' key)
- get information (CONTROL-I)
- back up or escape from anywhere (the ESC key)

Booting the Disk — Initializing the AFC

If the AFC is turned OFF, the first thing that happens when you boot the Menu Disk is that the AFC is automatically *initialized* with basic information which tells the AFC how to run, in general. The name for this basic information which you are using with your card is SYSTEM SOFTWARE 4.0. (The previous System Software for the AFC-Model 2e was System Software 2.3 and for the AFC-Model G32 was System Software 3.0P.)

The System Software stays on the card, even when you turn the computer OFF, because of the AFC memory backup system (see page xi). However, if the System Software on the card becomes damaged or if the card "loses its memory," all you need to do to restore it is this: turn the AFC OFF and boot the Menu Disk.

GETTING HELP OR INSTRUCTIONS

In addition to this manual, information about or instructions for using the Menu Disk is available in two shorter forms:

- **Help windows** on the Menu Disk provide brief instructions relevant to where you are in the Extended Menu program.
- **General Information** on the Menu Disk provides windows of abbreviated instructions per topic.

Help Windows

HELP WINDOWS on the Menu Disk are designed to answer the question "What am I supposed to do here?" when you are using the Extended Menu. Whenever the Extended Menu is on the screen, you can press the '?' key (you don't need to use SHIFT) or send the '?' or '/' via your special-input method. A Help window will appear with instructions. Read the instructions, then press any key for the window to disappear — you will be exactly where you left off when you pressed '?' but now you will have a better idea of what to do.

To obtain **HELP** while using the Menu Disk:

1. Press the '?' key.
2. Read the instructions.
3. Press any key for the window to disappear,

General Information

General Information, on the Menu Disk, provides you with windows of information on specific topics related to using the Menu Disk. You can make use of these windows, then quickly return to the Extended Menu. Topics include Version Info, Key Chart, Description, Choices, Method/Rate, Special Options, Overlay, Macros, Mouse/Joystick, Add a Setup, Delete a Setup, Copy a Setup, Rearrange Setups, Simplify/Expand, Quick-Start Menu, Operator's Setup, and Vital Statistics.

To obtain **GENERAL INFORMATION**:

1. **Boot the Menu Disk.**
2. **Press CONTROL-I** whenever the Extended Menu is on the screen, even if windows are open on the Menu

OR

Press '9' (or use SPACEBAR or ARROWS) to move to the end of the Extended Menu, then select **OTHER OPTIONS**. When the choices appear, select **GENERAL INFORMATION**.

GENERAL INFORMATION

SELECT TOPIC:

VERSION INFO

KEY CHART

DESCRIPTION

CHOICES

METHOD/RATE

SPECIAL OPTIONS

OVERLAY

MACROS

MOUSE/JOYSTICK

ADD A SETUP

DELETE A SETUP

COPY A SETUP

REARRANGE SETUPS

SIMPLIFY/EXPAND

QUICK-START MENU

CLEAR OS MENU

OPERATOR'S SETUP

VITAL STATISTICS

3. A menu of general information topics appears.

Use **SPACEBAR**, **ARROWS**, or the numbers **1-9** to move the cursor to the topic that interests you, then press **RETURN**.

You will get a window of information or instructions related to the topic you selected.

GENERAL INFORMATION

SELECT TOPIC:

VERSION INFO

KEY CHART

DESCRIPTION

CHOICES

For example, if you want **VERSION INFO** for the Menu Disk, move the cursor to **VERSION INFO**, then press **RETURN**.

GENERAL INFORMATION

SELECT TOPIC:

VERSION INFO

The System Software number for your Menu Disk will be listed here. Give this info when you request technical support or software upgrades.

You will see a window with information or instructions on the topic you selected.

Press any key to return to the general information topic menu.

From the general information menu, press **ESC** to return to the **Extended Menu**.

KEY CHART

The following keys or characters enable you to work with the Extended Menu:

SPACEBAR
DOWN ARROW
RIGHT ARROW

to move the cursor DOWN
within a menu

UP ARROW
LEFT ARROW

to move the cursor UP
within a menu

RETURN

to select the highlighted choice
OR to get further information about it

ESC

to back up or undo the last selection

1-9

to move the cursor to positions 1-9
on the Extended Menu ruler
(1 = beginning; 9 = end)

? or /

to get a Help window related to where you
are in the Extended Menu program

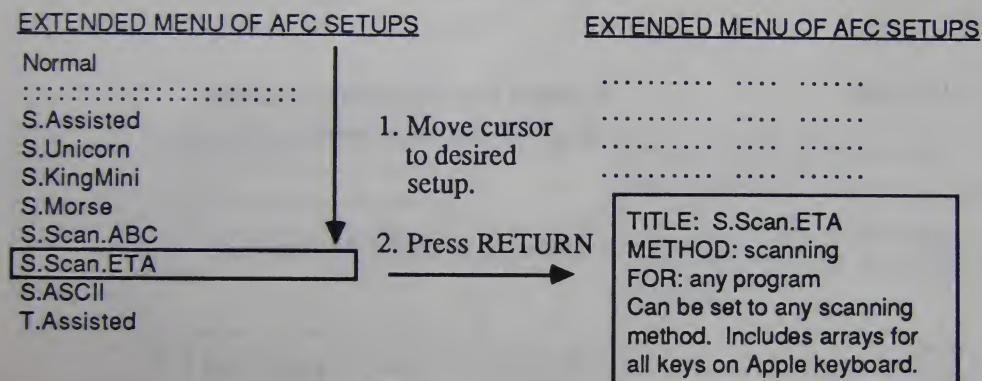
CONTROL-I

to bring up a general Information menu
related to the Menu Disk. Select any topic
from the menu to obtain abbreviated
instructions on that topic.

THE DESCRIPTION WINDOW

To obtain information about a setup on the Extended Menu, just move the cursor to the setup, then press RETURN. A **DESCRIPTION WINDOW** will appear, as shown in Figure 6-1.

Figure 6-1. Bringing Up the Description Window



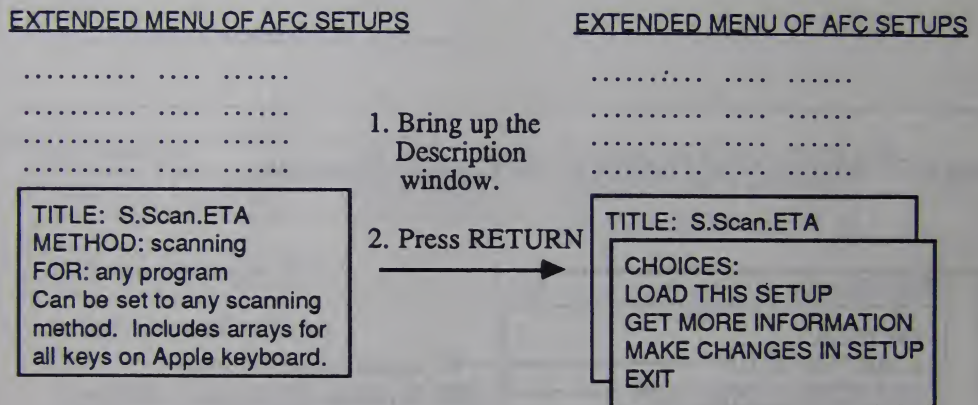
After reading the description, you may

- Press RETURN to see CHOICES related to that setup
- OR
- Press any key to return to the Extended Menu

THE CHOICES WINDOW

Once you see the Description window for a setup, as shown in Figure 6-1, you may press RETURN again to see a window of **CHOICES** related to that setup. This is shown in Figure 6-2.

Figure 6-2. Bringing Up the Choices Window



The choices available are:

LOAD THIS SETUP

to test the setup OR to use it with an application program

GET MORE INFORMATION

to learn more about the method, rate, special options, overlay, macros, or vital statistics for that setup

MAKE CHANGES
IN SETUP

to make permanent changes in the
description (Description window), or in
the method, rate, special options, overlay,
or macros for that setup

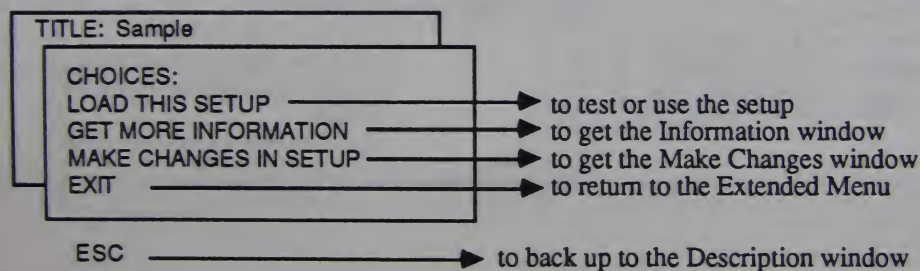
EXIT

to return to the Extended Menu

When the Choices window is on the screen, you may select any of the items
on the menu OR you may press ESC to back up to the Description window.

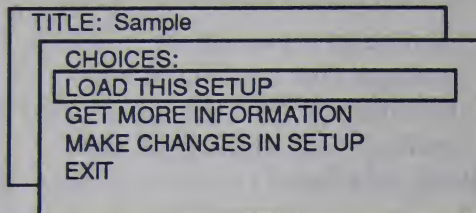
The choices are summarized in Figure 6-3 and are described in more detail
on the following pages.

Figure 6-3. Summary of Choices in the Choices Window



CHOICES: LOAD THIS SETUP

When you select **LOAD THIS SETUP** from the Choices window, the setup will be loaded onto the Adaptive Firmware Card and activated. (See Chapter 4). You will then be able to use the setup with an application program or to test the setup without an application program.



TITLE: Sample

CHOICES:

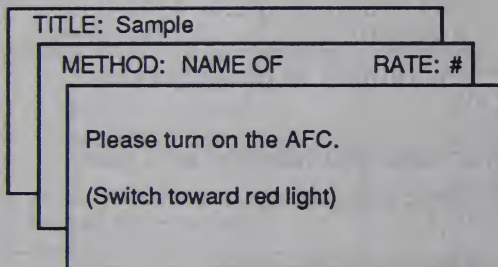
LOAD THIS SETUP

GET MORE INFORMATION

MAKE CHANGES IN SETUP

EXIT

1. From the Choices window, **move the cursor to LOAD THIS SETUP; press RETURN.**



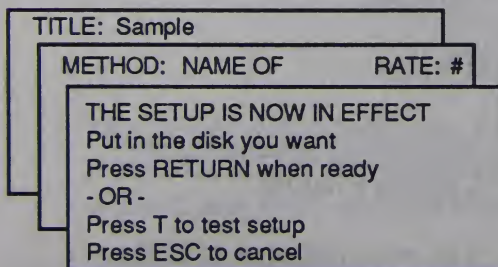
TITLE: Sample

METHOD: NAME OF RATE: #

Please turn on the AFC.

(Switch toward red light)

2. If your AFC is turned off, you will see a prompt, asking you to turn it on.



TITLE: Sample

METHOD: NAME OF RATE: #

THE SETUP IS NOW IN EFFECT

Put in the disk you want

Press RETURN when ready

- OR -

Press T to test setup

Press ESC to cancel

3. You may now **USE** the setup with an application program **OR TEST** the setup without an application program.

• **To USE the setup:**

1. **Put your application disk in the drive.**

2. **Press RETURN.**

The application disk will boot, and you can **USE** the setup with your application program.

TITLE: Sample

METHOD: NAME OF RATE: #

THE SETUP IS NOW IN EFFECT
 Put in the disk you want
 Press RETURN when ready
 - OR -
 Press T to test setup
 Press ESC to cancel

- To **TEST** or **TRY OUT** the setup, without an application disk, press the letter **T**.

TITLE: Sample

METHOD: NAME OF RATE: #

TEST MODE ESC to exit

 >

A test window appears.

Characters you enter through the keyboard or through an AFC input method will appear in the test window.

Note: If you get to the end of this window, the cursor will stay in the last space. Use **ARROW** characters to move the cursor back to the beginning.

In test mode, all characters you press or send will function as if you were using application software, with these exceptions:

DELETE produces a square.

TAB produces an 'I'.

CONTROL, COMMAND/OPEN-APPLE, OPTION/SOLID-APPLE, and RESET produce a tone but have no effect.

When you are done testing, press ESC.

TITLE: Sample

CHOICES:
 LOAD THIS SETUP
 GET MORE INFORMATION
 MAKE CHANGES IN SETUP
 EXIT

You will be returned to the Choices window.

You may make any selection from this window or press **ESC** to return to the Description window.

EXCEPTION: If you have a setup other than the setup titled **NORMAL** in the #1 position on the Extended Menu, some additional rules apply:

When you load a setup and the SETUP IN EFFECT window appears, if you press no characters for 35 seconds, the test window automatically appears. This lets you enter test mode even if a T is not part of the AFC overlay in this setup.

When the test window is on the screen, if you press no characters for 35 seconds, the Setup in Effect window reappears. If you press no characters for another 35 seconds, the Choices window will reappear. This lets you return to the Setup in Effect window or the Choices window even if ESC is not part of the overlay in this setup.

DISK-ERROR MESSAGES

If, when you select LOAD THIS SETUP, you get a DISK ERROR message, the prompt will describe the type of error the AFC has encountered. Two types of errors are: the Menu Disk is write protected or you have removed the Menu Disk too soon.

>> DISK ERROR >>
This disk must NOT
be WRITE PROTECTED

Press RETURN to try again.
Press ESC to cancel

If the prompt says "This disk must NOT be WRITE PROTECTED," take the disk out. If this is a 3.5 inch disk, turn it over. If the small black write-protect tab is toward the edge of the disk, push it back away from the edge. If this is a 5.25 inch disk, look for the square notch cut into the right side of the disk. If the notch is covered, remove the covering. Put the disk back in the drive and press RETURN.

The Menu Disk will not work properly if it is write protected. (The only Menu Disk you want to write protect is the original one, from which you make working copies.)

>> DISK ERROR >>
Please re-insert
the AFC MENU disk.

Press RETURN to try again.
Press ESC to cancel

If the prompt says "Please re-insert the AFC MENU disk," put the Menu Disk back in the drive and press RETURN. Do not remove the Menu Disk until the SETUP IN EFFECT window appears and instructs you to "put in the disk you want."

CHOICES: GET MORE INFORMATION

When you select **GET MORE INFORMATION** from the Choices window, you will get the Information window. From the Information window, you can learn more about the method/rate, special options, overlay, macros, or vital statistics *in this setup*. "Vital statistics" includes the size of the setup, levels in the overlay, and the status of speech feedback, macros, and mouse emulation capabilities.

Procedures and examples follow.

A diagram of a window titled "TITLE: Sample". Inside the window, the text "CHOICES:" is followed by a list of options: "LOAD THIS SETUP", "GET MORE INFORMATION", "MAKE CHANGES IN SETUP", and "EXIT". A rectangular box highlights the option "GET MORE INFORMATION", indicating it is the selected item.

1. From the Choices window, **move the cursor to GET MORE INFORMATION;** press **RETURN**.

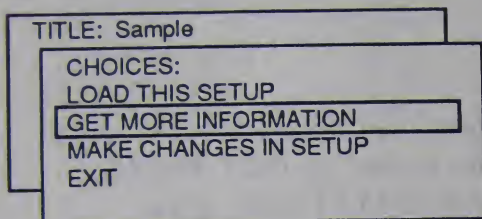
A diagram of a window titled "TITLE: Sample". Inside the window, the text "INFORMATION:" is followed by a list of topics: "METHOD/RATE", "SPECIAL OPTIONS", "OVERLAY", "MACROS", and "VITAL STATISTICS".

2. Now you see a list of the parts of that setup plus **VITAL STATISTICS**. Note: Method/rate, special options, overlay, and vital statistics will be part of any setup. Macros will be part of a setup only if an AFC.MACRO character is part of the overlay.

Move the cursor to the topic that interests you; press RETURN.

Get More Information: About Method/Rate

If you select **METHOD/RATE** from the Information window, you will learn more about the method and rate which are *in this setup*. An example is shown below.



TITLE: Sample

CHOICES:

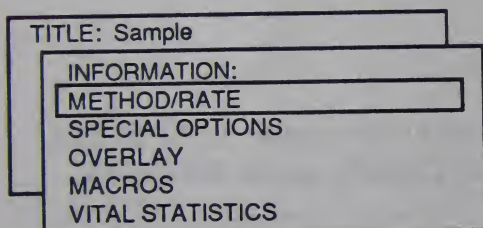
LOAD THIS SETUP

GET MORE INFORMATION

MAKE CHANGES IN SETUP

EXIT

1. From the Choices window, move the cursor to **GET MORE INFORMATION**; press **RETURN**.



TITLE: Sample

INFORMATION:

METHOD/RATE

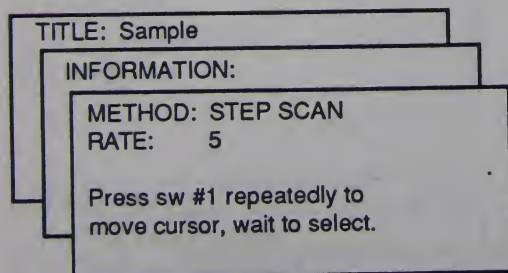
SPECIAL OPTIONS

OVERLAY

MACROS

VITAL STATISTICS

2. Move the cursor to **METHOD/RATE**; press **RETURN**.



TITLE: Sample

INFORMATION:

METHOD: STEP SCAN

RATE: 5

Press sw #1 repeatedly to
move cursor, wait to select.

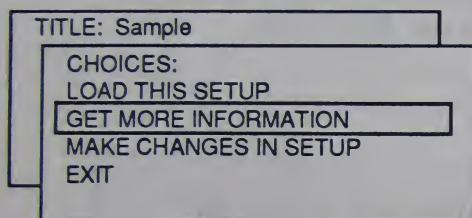
3. This window tells you the method and rate which are in this particular setup. A brief description of the method is included.

Press any key to return to the Choices window.

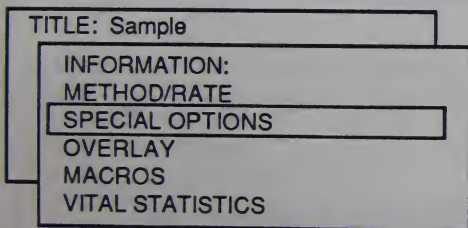
Get More Information: About Special Options

If you select **SPECIAL OPTIONS** from the Information window, you will see a menu which lists the Adaptive Firmware Card's special options *in this setup* and their current settings. From this menu you can get a description of an option by moving the cursor to that option, then pressing RETURN.

Procedures are described below.



1. From the Choices window, **move the cursor to GET MORE INFORMATION; press RETURN.**



2. Move the cursor to **SPECIAL OPTIONS; press RETURN.**

TITLE: Sample

SPECIAL OPTIONS	
SLOWDOWN	= <OFF>
SCAN SIZE	= 00
SCAN LINE	= 22
CLICK FEEDBACK	= <OFF>
REPEAT METHOD	= 00
REPEAT RATE	= 05
MESSAGE RATE	= 29
SWITCH DELAY	= <OFF>
AUTO-CAPS	= <OFF>
AFC.SPEECH	= <OFF>
FIX-IT KIT	= <OFF>
AFC.APPLEKEY	= <OFF>
AFC.MACROS	= <OFF>
MOUSE/JOYSTICK	= <OFF>

3. A menu of special options appears. The exact list of options will depend upon the input method in that setup and the characters in the overlay. (See Chapter 5.) **You may move the cursor up and down through this menu to see the value for any special option.**

From this menu,

- you may press ESC to return to the Choices window OR
- if you want more information about a special option, move the cursor to the name of the option; press RETURN.

TITLE: Sample

SPECIAL OPTIONS	
SLOWDOWN	= <OFF>
SCAN SIZE	= 00
SCAN LINE	= 22
CLICK FEEDBACK	= <OFF>
- more -	

For example, if you want to know more about SLOWDOWN, move the cursor to SLOWDOWN; press RETURN.

TITLE: Sample

SPECIAL OPTIONS	
OPTION: SLOWDOWN	
PRESENTLY= <OFF>	
RANGE: (0-255)	
Use SLOWDOWN to make any interactive program run more slowly. (255=slowest)	

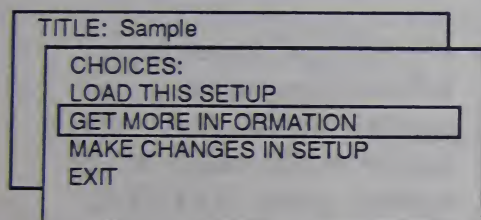
You will then see a window which describes the special option and gives its range of settings.

Press any key to return to the special options information menu.

Get More Information: About the Overlay

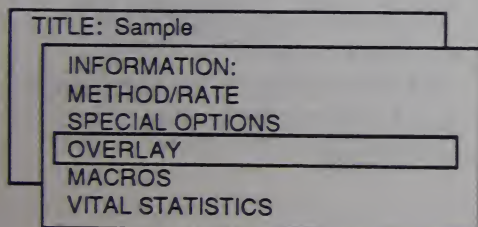
If you select **OVERLAY** from the Information window, you will get a listing of the contents of the overlay in this setup. The contents include a list of the **COMPUTER RECEIVES** for each item in each level of the overlay. You can have the listing displayed on the screen or sent to a printer. If **SPEECH FEEDBACK** is part of this overlay, this will also be listed for each item. Exactly how the overlay is listed will depend upon the input method.

Procedures follow.



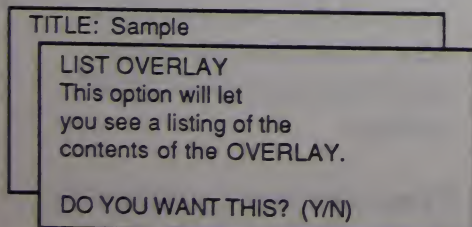
A screenshot of a menu titled "TITLE: Sample". Below the title, the word "CHOICES:" is followed by a list of options: "LOAD THIS SETUP", "GET MORE INFORMATION", "MAKE CHANGES IN SETUP", and "EXIT". The option "GET MORE INFORMATION" is highlighted with a rectangular box.

1. From the Choices window, **move the cursor to GET MORE INFORMATION;** press **RETURN**.



A screenshot of a menu titled "TITLE: Sample". Below the title, the word "INFORMATION:" is followed by a list of options: "METHOD/RATE", "SPECIAL OPTIONS", "OVERLAY", "MACROS", and "VITAL STATISTICS". The option "OVERLAY" is highlighted with a rectangular box.

2. **Move the cursor to OVERLAY;** press **RETURN**.



A screenshot of a screen titled "TITLE: Sample". Below the title, the text "LIST OVERLAY" is followed by a description: "This option will let you see a listing of the contents of the OVERLAY." At the bottom of the screen, the prompt "DO YOU WANT THIS? (Y/N)" is displayed.

3. The program will ask if you want to see a listing of the contents of the overlay. **Press Y.**

TITLE OF SETUP: Sample
INFO: OVERLAY

Please select:

- 1 - LIST CONTENTS
- 2 - EXIT TO EXTENDED MENU

Use arrows plus RETURN to select

4. From the next screen, you can list the contents of the overlay or return to the Extended Menu.

When the cursor is on LIST CONTENTS, press RETURN.

LISTING OF CONTENTS

Please select:

- 1 - DISPLAY ON SCREEN
- 2 - SEND TO PRINTER

Press ESCAPE to cancel

5. You can list the contents on the screen or you can send them to a printer, provided a printer is connected to your computer.

Move the cursor to your choice; press RETURN.

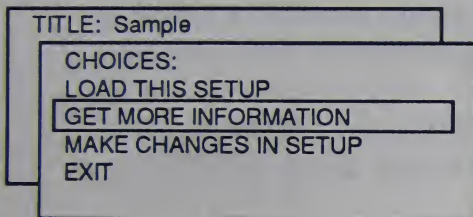
The program will proceed to list the contents of the overlay. For assisted keyboard, expanded keyboard, and Morse code overlays, the items will be arranged by level number and listed according to the key, code-name, or code sequence for each item, respectively. (For information about expanded keyboard code-names, see "Creating the Setup on Disk ... Basic Steps" in the EXPANDED KEYBOARD chapter.) Each item will show COMPUTER RECEIVES, and, if speech feedback is part of this overlay, the SPEECH for each item. If SPEECH is not listed, this is *not* a talking overlay.

For a scanning overlay, the listing will be arranged by array number, and will give the USER SEES, USER HEARS, COMPUTER RECEIVES, and SPEECH FEEDBACK for each array. If USER HEARS is not listed, this is not a talking overlay.

Get More Information: About Macros

If you select **MACROS** from the Information window, you will get a listing of the contents of the text macros, mouse macros, or mouse tabs in this setup. You can have the listing displayed on the screen or sent to a printer. If **SPEECH FEEDBACK** is part of this overlay, the **SPEECH** will also be listed for each macro.

Procedures follow.



TITLE: Sample

CHOICES:

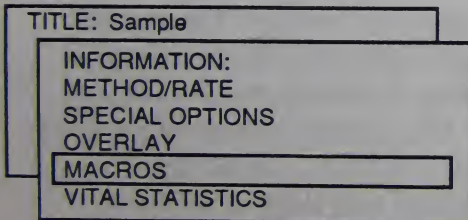
LOAD THIS SETUP

GET MORE INFORMATION

MAKE CHANGES IN SETUP

EXIT

1. From the Choices window, **move the cursor to GET MORE INFORMATION; press RETURN.**



TITLE: Sample

INFORMATION:

METHOD/RATE

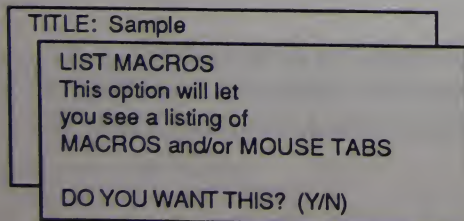
SPECIAL OPTIONS

OVERLAY

MACROS

VITAL STATISTICS

2. **Move the cursor to MACROS; press RETURN.**



TITLE: Sample

LIST MACROS

This option will let
you see a listing of
MACROS and/or MOUSE TABS

DO YOU WANT THIS? (Y/N)

3. The program will ask if you want to see a listing of the macros and/or mouse tabs. **Press Y.**

TITLE OF SETUP: Sample
INFO: MACROS

Please select:

- 1 - LIST CONTENTS
- 2 - EXIT TO EXTENDED MENU

Use arrows plus RETURN to select

4. From the next screen, you can list the contents of the macros or return to the Extended Menu.

When the cursor is on LIST CONTENTS, press RETURN.

LISTING OF CONTENTS

Which items do you want to list?

- MACROS
- MOUSE TABS
- ALL OF THE ABOVE

Press ESCAPE to cancel

5. If this setup has both macros and mouse tabs, you will be asked which type you want to list.

Move the cursor to your choice; press RETURN.

LISTING OF CONTENTS

Please select:

- 1 - DISPLAY ON SCREEN
- 2 - SEND TO PRINTER

Press ESCAPE to cancel

6. You can list the macros and mouse tabs on the screen or send them to a printer, provided a printer is connected to your computer.

Move the cursor to your choice; press RETURN.

MACROS

```
< P1 > = <OPEN-APPLE>P<RETURN>  
          <DOWN><DOWN><RETURN>  
          1<RETURN>
```

```
< P2 > = <OPEN-APPLE>P<RETURN>  
          <DOWN><DOWN><RETURN>  
          2<RETURN>
```

MOUSE/JOYSTICK TAB LOCATIONS

```
< A >   : X = 32  Y = 34  
< T21 > : X = 40  Y = 45
```

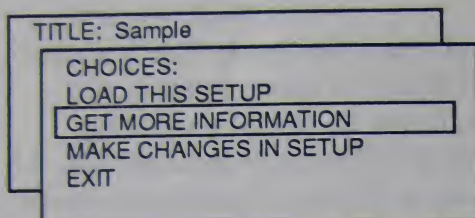
(press any key to continue)

7. The program will proceed to list the contents of the macros in this setup. The left -hand side of the screen will give the name for each macro or mouse tab (1-15 characters), and the right-hand side will give the characters stored in that macro (up to 100 characters each). If speech feedback is part of the overlay in this setup, the SPEECH for each macro will also be displayed.

For more information about text macros, see Chapter 17. For more information about mouse emulation, including mouse tabs and mouse macros, see Chapter 18.

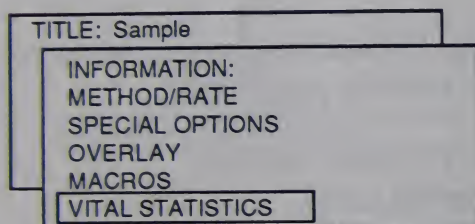
Get More Information: Vital Statistics

If you select VITAL STATISTICS from the Information window, you will get information about the size of this setup, the number of levels in the overlay, and the status of the speech feedback, macros, and mouse emulation capabilities of this setup.



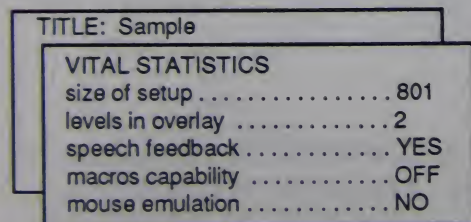
```
TITLE: Sample
CHOICES:
LOAD THIS SETUP
GET MORE INFORMATION
MAKE CHANGES IN SETUP
EXIT
```

1. From the Choices window, **move the cursor to GET MORE INFORMATION; press RETURN.**



```
TITLE: Sample
INFORMATION:
METHOD/RATE
SPECIAL OPTIONS
OVERLAY
MACROS
VITAL STATISTICS
```

2. **Move the cursor to VITAL STATISTICS; press RETURN.**



```
TITLE: Sample
VITAL STATISTICS
size of setup ..... 801
levels in overlay ..... 2
speech feedback ..... YES
macros capability ..... OFF
mouse emulation ..... NO
```

3. A listing of "statistics" for this setup appears.

Press any key to return to the Choices window.

SIZE OF SETUP tells you how large a setup is by giving you the number of bytes (characters) in that setup. The Quick-Start Menu can hold up to 4,096 bytes or characters, so the size of a setup affects how many setups fit on the Quick-Start Menu. (For more information, see Chapter 4.)

LEVELS IN OVERLAY tells you the highest level of the overlay which has information (1-10). You can add or edit levels by selecting Make Changes ... Overlay for that setup. (See the chapter for your input method.)

SPEECH FEEDBACK lets you know if speech feedback is part of the overlay and if the special option of AFC.SPEECH is on or off.

NO = the overlay does *not* include speech feedback.

YES = speech feedback is included and is on

OFF = speech feedback is included but is off

If **SPEECH FEEDBACK** = NO, you cannot add speech feedback. You'll need to look for another setup which has speech feedback, or create your own. If **SPEECH FEEDBACK** = YES or OFF, you can change the status by selecting Make Changes ... Special Options and turning AFC.SPEECH on or off. Deactivating the speech does not change the size of the setup, because the speech information remains stored in that setup. (For more information about using speech feedback, see Chapter 3.)

MACROS CAPABILITY lets you know if the AFC.MACRO character is part of the overlay and if the special option of AFC.MACROS is on or off.

NO = the overlay does *not* include the AFC.MACRO character.

YES = the character is included and the option is on

OFF = the character is included and the option is off

If **MACROS CAPABILITY** = NO, you can use Make Changes ... Overlay to add the AFC.MACRO character to the overlay. (For more information about macros, see Chapter 17.)

MOUSE EMULATION lets you know if the AFC.MOUSE/JOYSTICK character is part of the overlay and if the special option of MOUSE/JOYSTICK is on or off.

NO = the overlay does *not* include the AFC.MOUSE/JOYSTICK character.

YES = the character is included and the option is on

OFF = the character is included and the option is off

If **MOUSE EMULATION** = NO, you can use Make Changes ... Overlay to add the AFC.MOUSE/JOYSTICK character to the overlay. (For more information about mouse emulation, see Chapter 18.)

CHOICES: MAKE CHANGES IN SETUP

When you select **MAKE CHANGES IN SETUP** from the Choices window, you will get the Make Changes window. From the Make Changes window, you can make permanent changes in any part of a setup:

- the description (this is what appears on the Extended Menu and in the Description window)
- the method and rate
- the special options
- the overlay
- the macros

All changes made from the Make Changes window will be automatically saved on the Menu Disk. The sequence of windows is shown below.

A diagram of a window titled "TITLE: Sample". Inside the window, under the heading "CHOICES:", there is a list of options: "LOAD THIS SETUP", "GET MORE INFORMATION", "MAKE CHANGES IN SETUP", and "EXIT". The option "MAKE CHANGES IN SETUP" is highlighted with a rectangular box.

1. From the Choices Window, **move the cursor to MAKE CHANGES IN SETUP; press RETURN.**

A diagram of a window titled "TITLE: Sample". Inside the window, under the heading "MAKE CHANGES:", there is a list of options: "DESCRIPTION", "METHOD/RATE", "SPECIAL OPTIONS", "OVERLAY", and "MACROS".

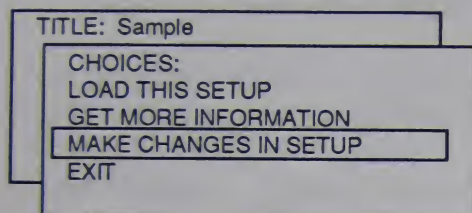
2. The Make Changes window appears.

Move the cursor to the part of the setup that you want to change; press RETURN.

Examples follow.

Make Changes in Setup: Changing the Description

If you select **DESCRIPTION** from the Make Changes window, you will be able to edit the description for that setup. The description you write will appear in the Description window. The first lines will also appear on the Extended Menu. Procedures are shown below.



TITLE: Sample

CHOICES:

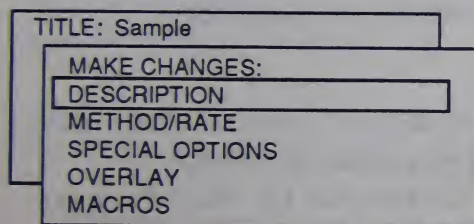
LOAD THIS SETUP

GET MORE INFORMATION

MAKE CHANGES IN SETUP

EXIT

1. From the Choices Window, **move the cursor to MAKE CHANGES IN SETUP; press RETURN.**



TITLE: Sample

MAKE CHANGES:

DESCRIPTION

METHOD/RATE

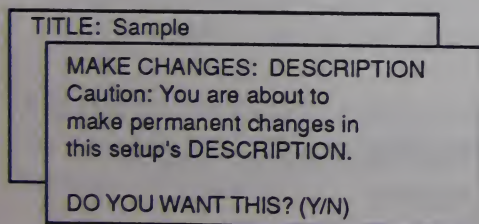
SPECIAL OPTIONS

OVERLAY

MACROS

2. The Make Changes window appears.

Move the cursor to DESCRIPTION; press RETURN.



TITLE: Sample

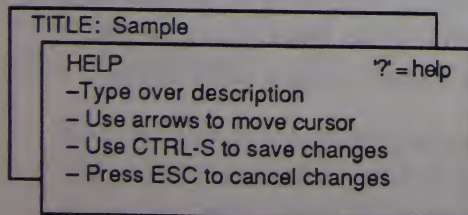
MAKE CHANGES: DESCRIPTION

Caution: You are about to make permanent changes in this setup's DESCRIPTION.

DO YOU WANT THIS? (Y/N)

3. A caution window appears.

Respond Y.



TITLE: Sample

HELP

? = help

-Type over description

- Use arrows to move cursor

- Use CTRL-S to save changes

- Press ESC to cancel changes

4. A Help window appears with instructions on how you can edit the description.

You can see this Help window at any time by press '?'

To go on, press any key.

TITLE: Sample
METHOD: scanning, etc.
FOR: Program name

Further description of setup which
can take up to three lines of
26 characters each.

5. The current Description window
appears.

**Notice the cursor over the
first letter in the title.**

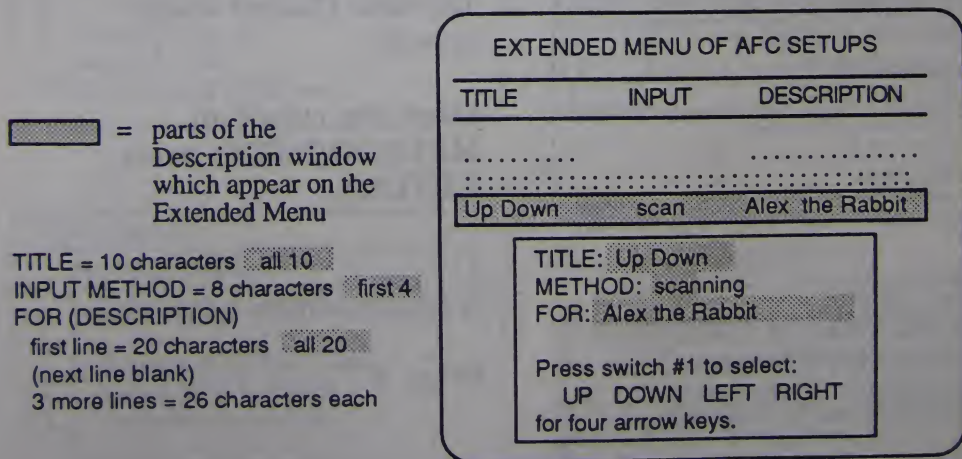
**Notice also that the word EDITING appears and is highlighted
near the upper left corner of the screen. You may now rewrite the
description:**

- Use ARROWS to move the cursor without writing
- Use SPACE to make a space blank.
- You cannot print '?' or '/' in the description.
- You cannot print in the first line under FOR.
- Press '?' at any time for Help.

**When done, press CONTROL-S to save the changes OR press ESC to
cancel the changes.**

Each part of the Description window has a maximum length. Figure 6-4
gives the length for each part and indicates what parts of the Description
window will appear on the Extended Menu.

Figure 6-4. Parts of the Description Window.

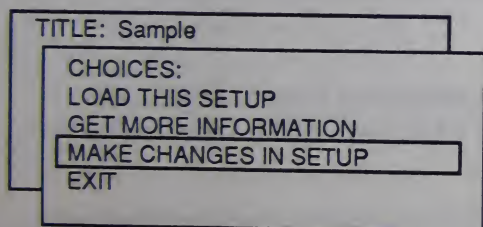


Make Changes in Setup: Changing the Method/Rate

There are two different ways to change the method and rate of a setup:

One way is to use CONTROL-A 1, as described in Chapter 4. This allows you to make changes *while* using a setup with application software. To back up your changes on the Menu Disk, you would need to use CONTROL-A 3. (See Chapter 4 for details.)

The other way is to use the Make Changes window, described here. Using the Make Changes window has two advantages: a description of method variations is provided as you go along, and the changes you make are automatically saved on the Menu Disk. To change the method or rate in this way, select METHOD/RATE from the Make Changes window, prior to loading and using the setup. Procedures are shown below.

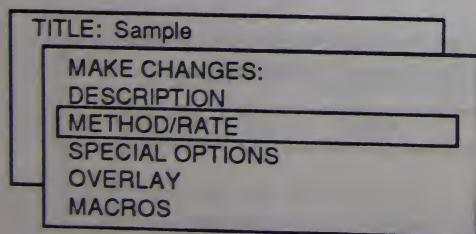


TITLE: Sample

CHOICES:

- LOAD THIS SETUP
- GET MORE INFORMATION
- MAKE CHANGES IN SETUP**
- EXIT

1. From the Choices window, **move the cursor to MAKE CHANGES IN SETUP; press RETURN.**



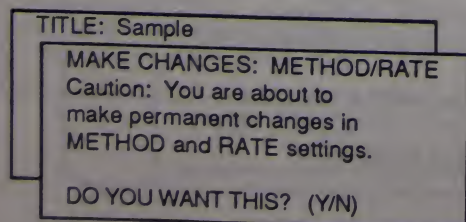
TITLE: Sample

MAKE CHANGES:

- DESCRIPTION
- METHOD/RATE**
- SPECIAL OPTIONS
- OVERLAY
- MACROS

2. The Make Changes window appears.

Move the cursor to METHOD/RATE; press RETURN.



TITLE: Sample

MAKE CHANGES: METHOD/RATE

Caution: You are about to make permanent changes in METHOD and RATE settings.

DO YOU WANT THIS? (Y/N)

3. A caution window appears.

Press Y.

TITLE: Sample

PLEASE SELECT METHOD:
 REGULAR SCAN
 REG.SCAN (ONGOING)
 STEP SCAN
 INVERSE SCAN

4. If method variations are available in this setup, a list of these will appear. The cursor will highlight the variation which is currently active in this setup. (If the method in this setup has no variations, the program will take you to step 6, below.)

Move the cursor to the variation you are interested in; press RETURN.

TITLE: Sample

PLEASE SELECT METHOD

METHOD: INVERSE SCAN

Hold switch #1 down to move.
 Wait or press sw#2 to select.

RETURN=SELECT ESC=EXIT

5. A description for that variation will appear.

To select this method for the setup, press RETURN, OR to exit this method, press ESC.

TITLE: Sample

METHOD: NAME OF

PLEASE SET RATE:

PRESENTLY= 5
 RANGE=1-29
 ENTER NEW RATE ==>

6. You will be asked to set the rate to be used with this method.

Enter the new rate and press RETURN, or just press RETURN to keep the current setting.

TITLE: Sample

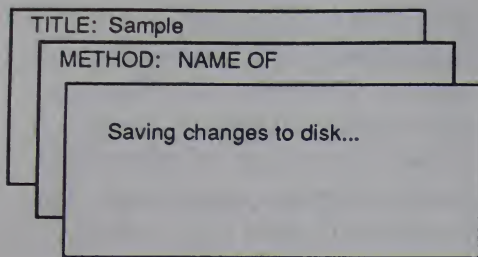
METHOD: NAME OF

RATE: 5

- If Method/Rate are correct please press RETURN
- To change, press ESC

7. Now you will see the method and rate which you selected.

If the method and rate are correct, press RETURN OR if they are not correct, press ESC to change.



8. The changes you made will be saved to disk automatically and you will be returned to the Choices window.

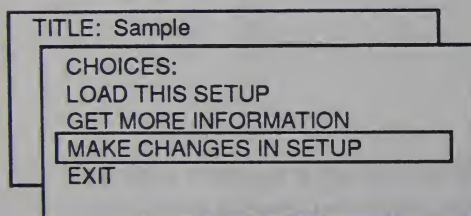
From the Choices window, you may make any selection from the window, OR you may press ESC to return to the Description window.

Make Changes in Setup: Changing the Special Options

There are two different ways to change the special options in a setup:

One way is to use CONTROL-A 2, as described in Chapter 4. This allows you to change *certain* special options *while* using a setup with an application program. To back up your changes on the Menu Disk, you would need to use CONTROL-A 3. (See Chapter 4 for details.)

The other way is to use the Make Changes window, described here. Using the Make Changes window has three advantages: a description of the special options is provided as you go along; you can change *any* of the settings; and the changes you make are automatically saved on the Menu Disk. To change the special options in this way, select SPECIAL OPTIONS from the Make Changes window, prior to loading and using the setup. Procedures are shown below.



TITLE: Sample

CHOICES:

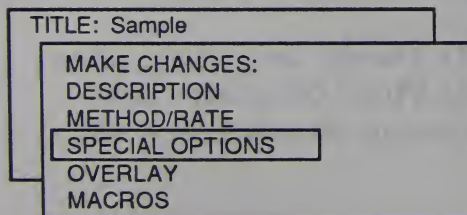
LOAD THIS SETUP

GET MORE INFORMATION

MAKE CHANGES IN SETUP

EXIT

1. From the Choices window, **move the cursor to MAKE CHANGES IN SETUP**; press **RETURN**.



TITLE: Sample

MAKE CHANGES:

DESCRIPTION

METHOD/RATE

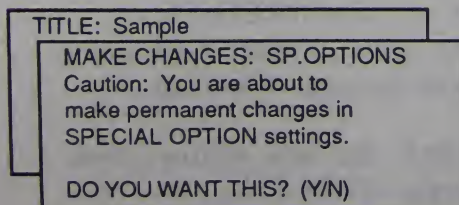
SPECIAL OPTIONS

OVERLAY

MACROS

2. The Make Changes window appears.

Move the cursor to SPECIAL OPTIONS; press **RETURN**.



TITLE: Sample

MAKE CHANGES: SP.OPTIONS

Caution: You are about to
make permanent changes in
SPECIAL OPTION settings.

DO YOU WANT THIS? (Y/N)

3. A caution window appears.

Press Y.

TITLE: Sample

SPECIAL OPTIONS

SLOWDOWN = <OFF>
SCAN SIZE = 00
SCAN LINE = 22
CLICK FEEDBACK = <OFF>
REPEAT METHOD = 00
REPEAT RATE = 05
MESSAGE RATE = 29
SWITCH DELAY = <OFF>
AUTO-CAPS = <OFF>
AFC.SPEECH = <OFF>
FIX-IT KIT = <OFF>
AFC.APPLEKEY = <OFF>
AFC.MACROS = <OFF>
MOUSE/JOYSTICK = <OFF>

4. Next you will see a menu of AFC special options for this setup. (This list will vary from setup to setup, depending on the input method and the characters in the overlay.)

Move the cursor to the option you want to change; press RETURN.

TITLE: Sample

SPECIAL OPTIONS

SLOWDOWN = <OFF>
SCAN SIZE = 00
SCAN LINE = 22
CLICK FEEDBACK = <OFF>
-- more --

For example, if you want to change the setting for SLOWDOWN, move the cursor to SLOWDOWN; press RETURN.

TITLE: Sample

SPECIAL OPTIONS

OPTION: SLOWDOWN

PRESENTLY= <OFF>

Use SLOWDOWN to make any interactive program run more slowly. (255=slowest)

RETURN=CHANGE

ESC=EXIT

5. You will see a window which describes the special option and gives the present setting.

To change the setting, press RETURN OR to exit without changing the setting, press ESC.

TITLE: Sample

SPECIAL OPTIONS

OPTION: SLOWDOWN

PRESENTLY= <OFF>

RANGE: (0-255)

ENTER NEW SETTING =>

6. If you pressed RETURN to change the setting, a window will appear with the range of settings.

Enter the new setting, then press RETURN.

TITLE: Sample	
SPECIAL OPTIONS	
SLOWDOWN	= 10
SCAN SIZE	= <OFF>
SCAN LINE	= 22
CLICK FEEDBACK	= <OFF>
- more -	

7. The program will return you to the special option listing with the new setting listed.

From here, you can select another option to change **OR press ESC to return to the Choices window.**

TITLE: Sample	
SPECIAL OPTIONS	
Saving changes to disk...	

8. When you press ESC, the changes you made will be saved to disk automatically and you will be returned to the Choices window.

From the Choices window, you may make any selection from the window, **OR** you may press ESC to return to the Description window.

Make Changes in Setup: Changing the Overlay

If you select OVERLAY from the Make Changes window, you can make changes in the overlay for that setup. An overlay includes what the USER SEES for that method and what the COMPUTER RECEIVES when an item from that overlay is selected. In the case of a talking overlay, the overlay also includes the speech feedback that the USER HEARS after selecting an item. The only way to edit any part of an overlay is to use the Make Changes window for that setup. To get started:

TITLE: Sample

CHOICES:

- LOAD THIS SETUP
- GET MORE INFORMATION
- MAKE CHANGES IN SETUP
- EXIT

1. From the Choices window, **move the cursor to MAKE CHANGES IN SETUP**; press **RETURN**.

TITLE: Sample

MAKE CHANGES:

- DESCRIPTION
- METHOD/RATE
- SPECIAL OPTIONS
- OVERLAY
- MACROS

2. The Make Changes window appears.

Move the cursor to OVERLAY; press **RETURN**.

TITLE: Sample

MAKE CHANGES: OVERLAY

Caution: You are about to make permanent changes in the OVERLAY of this setup.

DO YOU WANT THIS? (Y/N)

3. A caution window appears.

Press Y.

4. You will next be taken to the Create Overlay program for the input method in this setup. (For scanning, it's called the Scan-Create program.)

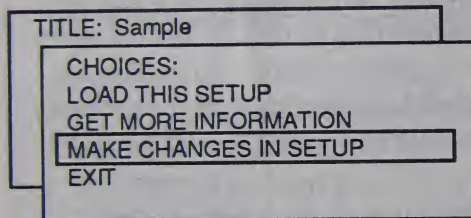
For details about creating or editing an overlay, see the chapter for your input method in Part II this manual.

Make Changes in Setup: Changing the Macros

There are two different ways to change the text macros, mouse/joystick macros, or mouse/joystick tabs in a setup:

One way is to make the changes while using an application. This is usually the most natural way. To back up your changes on the Menu Disk, use CONTROL-A 3 when you are done with the application program. (See Chapter 17 for text macros, Chapter 18 for mouse/joystick tabs and macros.)

The other way is to use the Macro Manager program, which you enter through the Make Changes window, described here. The Macro Manager program has the advantage of providing a full-screen environment for editing and listing macros. To make changes in this way, select MACROS from the Make Changes window prior to loading and using the setup, as shown below.



TITLE: Sample

CHOICES:

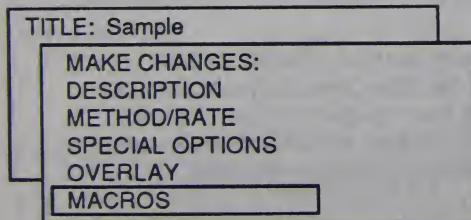
LOAD THIS SETUP

GET MORE INFORMATION

MAKE CHANGES IN SETUP

EXIT

1. From the Choices window, **move the cursor to MAKE CHANGES IN SETUP; press RETURN.**



TITLE: Sample

MAKE CHANGES:

DESCRIPTION

METHOD/RATE

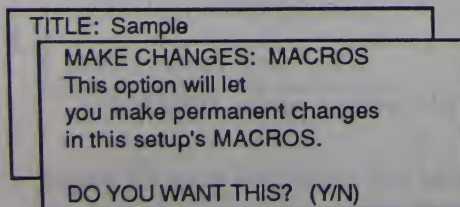
SPECIAL OPTIONS

OVERLAY

MACROS

2. The Make Changes window appears.

Move the cursor to MACROS; press RETURN.



TITLE: Sample

MAKE CHANGES: MACROS

This option will let
you make permanent changes
in this setup's MACROS.

DO YOU WANT THIS? (Y/N)

3. You will be asked to verify your selection.

Press Y.

4. You will next be taken to the Macro Manager program. *For details about using the Macro Manager program, see Chapter 17.*

USING AN "S" OR "T" SETUP

EXTENDED MENU OF AFC SETUPS

Normal
.....
S.Assisted
S.Unicorn
S.KingMini
S.Morse
S.Scan.ABC
S.Scan.ETA
S.ASCII
T.Assisted
T.Unicorn
T.KingMini
T.Morse
T.Scan.ABC
T.Scan.ETA

The first setups on your Extended Menu begin with "S" or "T" and include the name of the input method as part of the title.

Each "S" setup contains a "standard" overlay, and each "T" setup contains a "talking" standard overlay. The "S" setups take up less memory, but the "T" setups can provide speech feedback for the input method through a speech synthesizer.

Using an "S" or "T" setup can take some practice, just as using the computer keyboard takes practice, because the standard overlay in the "S" or "T" setup has as many characters and functions as the Apple keyboard. To explore an "S" or "T" setup, first change it to your method/rate, load it, and try the test window, as described below. Once the test window appears, use the tutorial in the "Using ..." section of the chapter for your input method to step through the basics and the special features for your method and overlay. Notes in small italics relate to the tutorial in the chapter for your method.

You can use either an "S" or "T" setup with your tutorial. The Menu Disk is shipped with "Change Speech" configured to the Echo Speech Synthesizer and the speech option in the "T" setups on. If you have a different type of speech synthesizer, or if other people may have made changes in this disk or the setup, see Chapter 3 for reconfiguring the disk or activating the speech option.

To use an "S" or "T" setup:

1. Boot the AFC Menu Disk.
2. Move the cursor to your "S" or "T" setup; press RETURN.

If the above list of "S" and "T" setups does not appear on your Extended Menu, your Menu may have been *simplified* for a certain input method. To explore this option, or to *expand* the Menu to all setups, see "Simplifying or Expanding the Extended Menu" later in this chapter.

TITLE: S. _____
METHOD: name of method
FOR: any program

A description of the setup appears here. May include information about method, rate, and overlay.

3. A Description window appears. With scanning, Morse code, and ASCII setups, variations in the method are available. With all setups, rate is adjustable.

Press RETURN.

"S" OR "T" SETUP: CHANGE METHOD/RATE

TITLE: S. _____
CHOICES:
LOAD THIS SETUP
GET MORE INFORMATION
MAKE CHANGES IN SETUP
EXIT

4. The Choices window will appear. To change the method or rate in this setup, **move the cursor to MAKE CHANGES IN SETUP; press RETURN.**

TITLE: S. _____
MAKE CHANGES;
DESCRIPTION
METHOD/RATE
SPECIAL OPTIONS
OVERLAY
MACROS

5. The Make Changes window appears.

Move the cursor to METHOD/RATE; press RETURN.

TITLE: S. _____
MAKE CHANGES: METHOD/RATE
Caution: You are about to
make permanent changes in
METHOD and RATE settings.
DO YOU WANT THIS? (Y/N)

6. A caution window will appear.

Press Y.

TITLE: S. _____

PLEASE SELECT METHOD:
REGULAR SCAN
REG.SCAN (ONGOING)
STEP SCAN
INVERSE SCAN

7. If the method for this setup has variations, you will be asked to select a method from the list of variations.

Move the cursor to the variation you are interested in; press RETURN.

If you are trying out Morse code or scanning, the tutorial in those chapters suggests you try out the methods in the order given. For Morse code, start with 2-SW HIGH/LOW. For scanning, start with REGULAR SCAN.

For ASCII, select the type of ASCII which your communication device sends.

Assisted keyboard, expanded keyboard, normal-input, and multiple switch box, have no variations. In this case, the screen will take you directly to step 9 below (to set the rate).

TITLE: S. _____

PLEASE SELECT METHOD

METHOD: NAME OF METHOD

A description of this method
appears here.

RETURN=SELECT

ESC=EXIT

8. A description for the method you selected will appear.

To change the setup to this method, press RETURN, OR to choose a different method, press ESC.

TITLE: S. _____

METHOD: NAME OF METHOD

PLEASE SET RATE:

PRESENTLY= 5

RANGE=1-29

ENTER NEW RATE ==>

9. You will next be asked to set the rate for your input method.

Enter the new rate and press RETURN, or just press RETURN to keep the current setting.

For assisted keyboard, try 7. For expanded keyboard, try 20. For Morse code, try 5. For scanning, try 6. (These are the rates suggested in the tutorial for your input method. For ASCII, see the ASCII INPUT chapter.)

TITLE: S. _____

METHOD: NAME OF METHOD

RATE: Number

- If Method/Rate are correct please press RETURN
- To change, press ESC

10. Now you will see the method and rate which you selected.

If the method and rate are correct, press RETURN OR if they are not correct, press ESC to change.

"S" OR "T" SETUP: LOAD AND TEST

TITLE: S. _____

CHOICES:

LOAD THIS SETUP

GET MORE INFORMATION

MAKE CHANGES IN SETUP

EXIT

11. The changes you made will be saved to disk automatically, and the Choices window will reappear.

The cursor will be on LOAD THIS SETUP; press RETURN.

TITLE: S. _____

METHOD: NAME OF RATE: #

Please turn on the AFC.

(Switch toward red light)

12. If your AFC is not on, you will be prompted to turn it on.

Notice that the method and rate are displayed in the middle window.

Turn on the AFC (flip the toggle toward the red light).

TITLE: S. _____

PLEASE SELECT METHOD

METHOD: NAME OF METHOD

A description of this method appears here.

RETURN=SELECT ESC=EXIT

13. You will see a window telling you **THE SETUP IS NOW IN EFFECT**. You have several choices here.

To test the setup, press **T** and go to step 14.

- OR -

If you are familiar with the setup and ready to use it with application software, insert the application disk, and press **RETURN**. The disk will boot, and you can use the setup to run your program.

*If you are using this as a tutorial, press **T** to Test the setup.*

TITLE: S. _____

METHOD: NAME OF RATE: #

TEST MODE ESC to exit

>

14. If you pressed **T**, a Test Mode window will appear. You can now use your input method to send characters to the test window.

If you are following this as a tutorial, continue reading the next page to learn about the test window.

NOTE: If you have a setup other than the setup titled **NORMAL** in the #1 position on the Extended Menu, you don't need to press **T** for the test window to appear — just press no characters for 35 seconds. Similarly, the test window will disappear if you press no characters for 35 seconds. (See pages 6-10 through 6-11, this chapter.)

"S" OR "T" SETUP: USING THE TEST WINDOW

With the Test Mode window on the screen, you are ready to test the AFC setup. Keep in mind, however, that the test window is a small program, designed only for testing your AFC setups. Its rules and limitations are:

- If you get to the end of the window, the cursor will just stay in the last space — use the ARROW keys to move the cursor back to the beginning of the window. (Once you are familiar with your overlay, the ARROW characters and the AFC REPEAT character will be useful here.)
- All keys on the Apple keyboard (and the characters in your overlay) will function as if you were using application software, with these exceptions:

ESC causes you to exit the test window

DELETE produces a square (use LEFT ARROW to backspace)

TAB produces an 'I'

Some keys/characters produce a tone but have no other effect in the test window:

COMMAND/OPEN-APPLE
CONTROL

OPTION/SOLID-APPLE
RESET

The function of these characters depends on the application software — they function as above in the test window but will work correctly when used with appropriate application software.

When you are done testing, press ESC.

NOTE: If you have a setup other than the setup titled NORMAL in the #1 position on the Extended Menu, you don't need to press ESC to exit the test window — if you press no characters for 35 seconds, the Setup in Effect window reappears. If you press no characters for another 35 seconds, the Choices window will reappear. (See pages 6-10 through 6-11, this chapter.)

"S" OR "T" SETUP: SPECIAL CHARACTERS AND FUNCTIONS

Every standard overlay contains all the characters and functions as the Apple keyboard, including such special characters as REPEAT, CAPS LOCK, CONTROL, COMMAND/OPEN APPLE, and OPTION/SOLID-APPLE.

REPEAT

The AFC has a special REPEAT character for each input method. You use this character to repeat whatever character or function you previously selected, repeating it once, or twice, or continuously at a set rate. How quickly the character continuously repeats is determined by a special-option setting called REPEAT RATE. Ordinarily, the setting of REPEAT RATE will be adjusted automatically when you set the rate for the method in a given setup. (Method rates of 1-9 will have repeat rates of 1-9, respectively. Rates of 10-29 will have a repeat rate of 10.) Setting a slower rate (1-9) for the method will also slow down the repeat rate. To speed up or slow down the repeat rate without changing the rate for your method, use the special option of REPEAT RATE. (See Chapter 5.)

CAPS LOCK VERSUS SHIFT

Every AFC method has special characters for CAPS LOCK and SHIFT. The AFC CAPS LOCK is like the CAPS-LOCK key on the computer keyboard: it toggles you from all-lower-case to all-upper-case and vice-versa. The SHIFT character is like the SHIFT key: it lets you get upper case for one letter only.

When you first load a setup which has CAPS LOCK in the overlay, the CAPS LOCK is OFF, so letters selected through the input method will be sent as lower-case. If the overlay does not contain CAPS LOCK, all letters will automatically be sent as upper case.

You can reduce the number of times you need to use the SHIFT character by making use of the special option of AUTO-CAPS. Turning on AUTO-CAPS means the AFC will automatically capitalize any letter you send after a period, question mark, exclamation point, or RETURN. AUTO-CAPS is available in any setup which includes CAPS LOCK in the overlay. (See Chapter 5.)

CONTROL SEQUENCES

When you use the Apple keyboard, you are often required to hold down two or more keys at the same time, such as CONTROL-G (to get a bell sound) or CONTROL-OPEN-APPLE-RESET to boot a disk.

With an AFC input method, you simply select the required characters in sequence. For example:

- When a CONTROL- character is needed, select the CONTROL character, then select the associated character.
- To boot a disk, select the CONTROL character in your overlay, then the OPEN-APPLE character, then the RESET character. This will cause whatever disk is in the drive to reboot, just as if you had held down three keys at the same time on the Apple keyboard.

If you're reading this as part of a tutorial, don't try CONTROL-OPEN-APPLE-RESET now — you'll be trying it later in the chapter for your input method.

COMMAND/OPEN-APPLE AND OPTION/SOLID-APPLE

Most application programs that use the COMMAND/OPEN-APPLE and OPTION/SOLID-APPLE keys expect you to hold down the APPLE key while pressing another key, such as holding down OPEN-APPLE and pressing P to print in AppleWorks. We call this *latching*. The AFC does this automatically when you select the AFC characters for the individual APPLE keys.

Some application programs, however, expect you to use these keys by themselves, rather than in combination with other keys. In this case, we say the function of the APPLE keys is *momentary* rather than *latching*, and the AFC's APPLEKEY parameter needs to be adjusted accordingly. (See Chapter 21.)

SHORT CUTS FOR ADVANCED USERS

Quicker Loading of a Setup

Selecting setups from the Extended Menu is useful for a beginner, since the Menu Disk provides descriptions and prompts as you go along. A quicker way, however, is to use the Quick-Start Menu. The Quick-Start Menu will appear immediately when you turn on the computer, provided the AFC ON/OFF switch is in the ON position. If the setup you want is on the Quick-Start Menu, you can select the setup from there — without using the Menu Disk at all. Day-to-day use of the Quick-Start Menu is very simple:

1. Have your AFC turned ON.
2. Have your application disk (*not* the AFC Menu Disk) in the drive.
3. Turn the computer ON: the AFC QUICK-START MENU will appear immediately.
 - **To select the first setup**, press or select RETURN. The application disk will boot, and you'll be ready to go.
 - **To select any other setup** on the Quick-Start Menu, move the cursor to the setup, then press or select RETURN. The application disk will boot, and the setup you selected will be active.

NOTE: When the computer is first turned on (with the AFC ON), the setup in the #1 position will be immediately active as soon as the Quick-Start Menu is on the screen. To have your own setup immediately active, see the next page.

For more information about the Quick-Start Menu, see Chapter 4.

Changing Method or Rate

There are two ways to change your AFC method or rate: use the Make Changes window on the Extended Menu or use CONTROL-A 1 to make changes while using an application program. Using CONTROL-A 1 is quicker — and useful for experimenting. (See Chapter 4.) Changes made with CONTROL-A 1 are saved in the copy of the setup that is on the AFC. To also save these changes on the Menu Disk, use CONTROL-A 3. (See Chapter 4.)

HAVING YOUR SETUP ACTIVE AT STARTUP

The AFC is often used in a multi-user setting, so we ship the Menu Disk with a setup called "Normal" in the #1 position. It assumes the person using the Quick-Start Menu or the Menu Disk is a teacher or helper who uses the Apple keyboard to select and load setups. To avoid confusion, the method in this setup is the "normal-input" method, rather than assisted keyboard, expanded keyboard, Morse code, or scanning.

If you have a preferred setup, such as an "S" or "T" setup, that meets your needs for general-purpose use of the computer, we suggest moving that setup to the #1 position on the Extended Menu, above the double dotted line. There are two clear reasons for doing so:

- **When you turn on the computer, with the AFC ON, the #1 setup is immediately active.** If the #1 setup has your method, rate, and preferred overlay, you can proceed immediately to use your method to select the #1 setup or any other setup on the Quick-Start Menu that you want to use. (See "Quicker Loading of a Setup," on the preceding page.)
- **The #1 setup is immediately active whenever you use the AFC Menu and Construction Disk,** regardless of what setup was last used with the AFC. If the #1 setup has your method, rate, and a full-access overlay, you can use that setup to explore the Extended Menu, make changes in setups, add new setups, etc.

If, while using the Extended Menu, you load and test another setup, the new setup will be active in the test window, but when you leave the test window and return to the Extended Menu, the #1 setup will re-activate.

To move your setup to the #1 position:

1. Boot the Menu Disk.
2. Move the cursor to the setup to be moved.
3. Press CONTROL-R (for Rearrange).
4. Use the ARROW to move the highlighted setup to the #1 position, above the double dotted line — as far up as it will go.
5. Press RETURN when done OR press ESC to cancel the move.

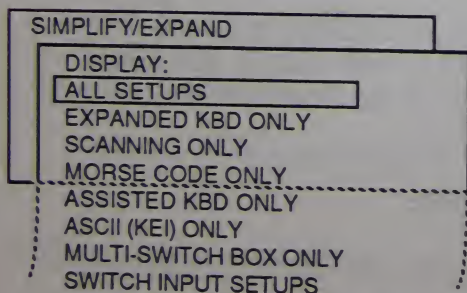
SIMPLIFYING OR EXPANDING THE EXTENDED MENU

You can SIMPLIFY the appearance of the Extended Menu so that the Menu shows only those setups which use a certain category of input method, such as scanning or expanded keyboard. This can make the Extended Menu easier to read or make it easier to find the setups you want. When you simplify the menu, you are not permanently removing any setups from the Menu Disk — you can get the hidden setups back at any time by choosing to EXPAND the Menu.

Note: The simplify function will not make the setup in the #1 position disappear, even if you simplify for an input method different from the one in this setup. For information about the #1 position, see the previous page (page 6-43).

To simplify or expand the Extended Menu, use the SIMPLIFY/EXPAND option near the end of the Extended Menu. The steps are:

1. Boot the Menu Disk.
2. Press '9' (or use SPACEBAR or ARROWS) to move to the end of the Extended Menu.
3. Move the cursor to the SIMPLIFY/EXPAND line.
4. Press RETURN.



5. A window will appear, showing various DISPLAY options. The first line is ALL SETUPS. Notice the word "more" at the bottom — this indicates there are more choices in the window than you can see at one time.

- To SIMPLIFY for a given input method, move the cursor to that method and press RETURN.
OR
- To EXPAND to display all setups, move the cursor to ALL SETUPS, then press RETURN.

DELETING A SETUP

You can DELETE a setup from the Menu Disk, but be careful — deleting a setup is a permanent change. Once you delete a setup, you cannot get it back! The steps for deleting a setup are:

1. Boot the Menu Disk.
2. Move the cursor to the setup to be deleted.
3. Press CONTROL-D.

A caution window will appear, warning you that you are about to permanently delete this setup from this disk.

4. Respond Y or N to the caution window.

If you do not wish to permanently remove a setup but you want to temporarily hide a group of setups from the Extended Menu display, you may be able to use the Menu Disk Simplify option. (See "Simplifying/Expanding the Extended Menu," page 6-44.)

If you wish to remove a setup from the *Quick-Start Menu* but do not wish to remove it permanently from the disk, don't use CONTROL-D to delete it! If the setup is in the *fixed* portion of the Quick-Start Menu, you can remove it, without deleting it, by moving it below the dotted line on the Extended Menu (see *Rearranging Setups*, page 6-47.) If the setup is in the *temporary* portion of the Quick-Start Menu, it will move out once you have used different setups, or you can deliberately "clear out" all the temporary setups (see Chapter 4).

COPYING A SETUP

You can make an exact COPY of a setup on the same Extended Menu. A copy (duplicate) of the setup can be useful if you want to make minor changes in the setup and give it a new title, without losing or changing the original setup.

For example, you might want to change the UP DOWN setup so that it belongs to Sue, that is, so that it has the same overlay but her method and rate and her name. You could copy the setup, then change the method and rate for Sue, and change the title to SUE'S ALEX. Or you might want to make a minor change in the overlay in an "S" or "T" setup while saving the original as is.

The steps for making a copy of a setup on the same Menu Disk are:

1. Boot the Menu Disk.
2. Move the cursor to the setup to be copied.
3. Press CONTROL-C.
4. Respond Y to the caution window.

To copy a setup to or from a different Menu Disk, see "Other Options ... Transfer Setups," later in this chapter.

REARRANGING (MOVING) SETUPS

You can REARRANGE or MOVE setups to different locations on your Extended Menu. You can do this by selecting the setup on the Menu Disk and using CONTROL-R to Rearrange (move) the setup. The steps are:

1. Boot the Menu Disk.
2. Move the cursor to the setup to be moved.
3. Press CONTROL-R (for Rearrange).
4. Use the ARROW to move the highlighted setup to new location.
5. Press RETURN when done OR press ESC to cancel the move.

The rearranged order of setups will be saved automatically on the Menu Disk.

You may also use CONTROL-R to move a setup to or from or within the fixed portion of the Quick-Start Menu:

- To move a setup *to* the fixed Startup Menu, use CONTROL-R to move it *above* the dotted line on the Extended Menu.
- To remove a setup *from* the fixed Startup Menu, use CONTROL-R to move *below* the dotted line on the Extended Menu.
- To rearrange the order of setups within the fixed Startup Menu, use CONTROL-R to rearrange the setups as desired.

For more information about the Quick-Start Menu, see Chapter 4.

OTHER OPTIONS

OTHER OPTIONS is a list of options available at the end of the Extended Menu. The options are:

GENERAL INFORMATION

to bring up a list of topics, each with a window of abbreviated instructions or information. This is the same General Information you get when you press CONTROL-I.

CLEAR QUICK-START MENU

to clear out the setups stored in the temporary portion of the Quick-Start Menu.

CHANGE SPEECH

to check or change the type of speech synthesizer your AFC Menu and Construction Disk is configured to use (for AFC speech feedback).

TRANSFER SETUPS

to transfer a setup from one Menu Disk to another with one computer or over a distance with a telephone modem.

To use these options:

EXTENDED MENU OF AFC SETUPS

.....
.....
.....
.....

.....

ADD A NEW SETUP

DELETE/COPY/REARRANGE

SIMPLIFY/EXPAND

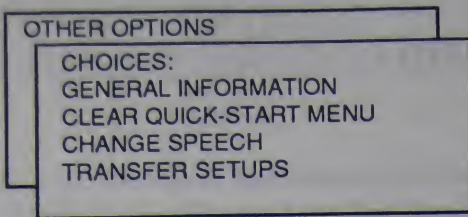
OTHER OPTIONS

QUIT

1. Boot the Menu Disk.

Press '9' (or use SPACEBAR or ARROWS) to move the cursor to the end of the Extended Menu.

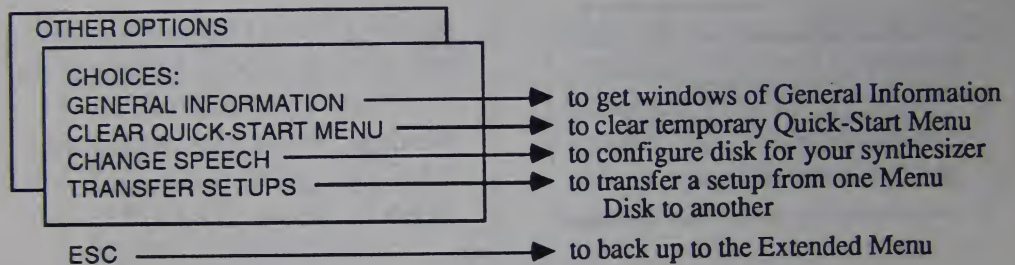
Move the cursor to OTHER OPTIONS; press RETURN.



2. A list of choices will appear.

The options in OTHER OPTIONS are summarized in Figure 6-5 and are described in more detail on the following pages.

Figure 6-5. Summary of Options in the Other Options Window



OTHER OPTIONS: GENERAL INFORMATION

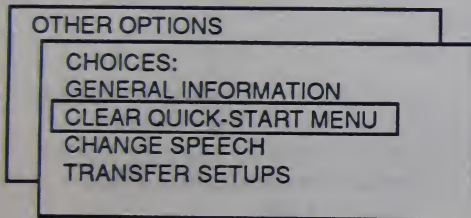
When you select "Other Options ... General Information" from the Extended Menu, you will get the same General Information topics and windows which you get when you press CONTROL-I when the Extended Menu is on the screen.

For details, see "General Information" in this chapter, pages 6-3 to 6-4.

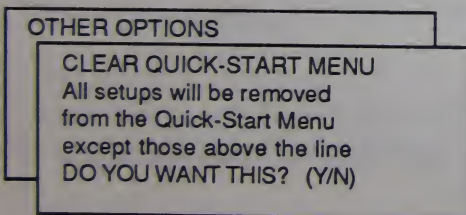
OTHER OPTIONS: CLEAR QUICK-START MENU

Whenever you load a setup from the Extended Menu and use it with an application program, the AFC automatically adds that setup to the *temporary* portion of the Quick-Start Menu, provided the *fixed* portion of the Quick-Start Menu is not already full. (This is explained with text and drawings in "Learning More About the Quick-Start Menu," Chapter 4.)

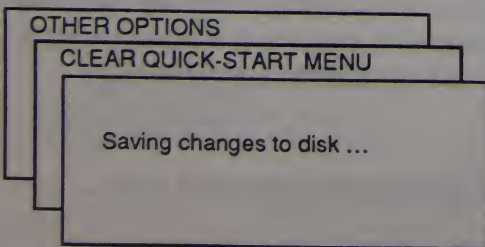
The AFC will also automatically remove setups from the temporary Quick-Start Menu, when room is needed. You can also clear out the temporary Quick-Start Menu yourself with the steps shown below. "Clearing the Quick-Start Menu" does not remove setups from the fixed Quick-Start Menu or from the Extended Menu.



1. Select **OTHER OPTIONS** at the end of the Extended Menu. From the Other Options Choices window, **move the cursor to CLEAR QUICK-START MENU; press RETURN.**



2. A caution window will appear.
Press Y.

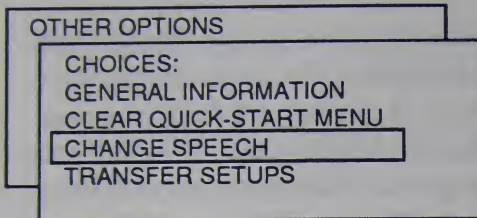


3. The disk drive will go on. A third window will show "Saving changes to disk ..."

After the changes have been saved, you will be returned to the Extended Menu.

OTHER OPTIONS: CHANGE SPEECH

To use AFC speech feedback, the overlay in the setup must have been created to include speech feedback, the special option of AFC.SPEECH must be ON in that setup, and the Menu Disk must be configured for your type of speech synthesizer. To check or change the configuration of the disk:

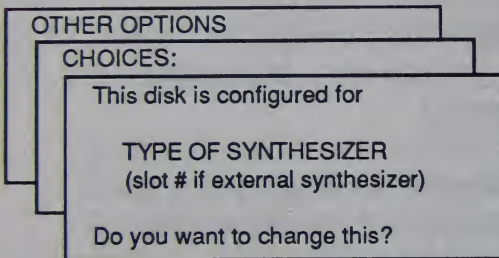


OTHER OPTIONS

CHOICES:

- GENERAL INFORMATION
- CLEAR QUICK-START MENU
- CHANGE SPEECH**
- TRANSFER SETUPS

1. Select **OTHER OPTIONS** at the end of the Extended Menu. From the Other Options Choices window, **move the cursor to CHANGE SPEECH; press RETURN.**



OTHER OPTIONS

CHOICES:

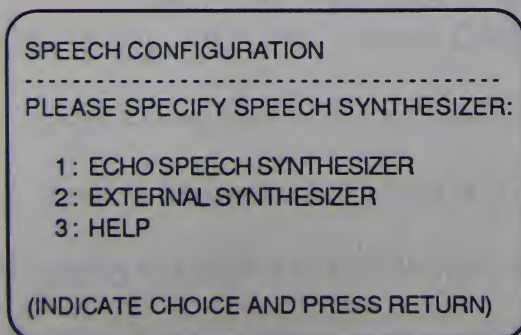
This disk is configured for

TYPE OF SYNTHESIZER
(slot # if external synthesizer)

Do you want to change this?

2. The type of synthesizer the disk is configured for will appear. If configured for an "external synthesizer," the slot number the disk is configured for will also appear.

To change this configuration, **press Y.**



SPEECH CONFIGURATION

PLEASE SPECIFY SPEECH SYNTHESIZER:

- 1: ECHO SPEECH SYNTHESIZER
- 2: EXTERNAL SYNTHESIZER
- 3: HELP

(INDICATE CHOICE AND PRESS RETURN)

3. The screen will list the types of synthesizers you can use: an Echo Speech Synthesizer or an external speech synthesizer. (An external synthesizer is one which connects to a serial interface card in some slot or to the built-in modem or printer port of the Apple IIGS — see Chapter 3.)

Move the cursor to your type of synthesizer, then press RETURN.

4. If you select "external synthesizer," the screen will next ask you to specify the location (the slot number) for that synthesizer.

For the Apple II GS, the built-in printer port is slot #1 and the built-in modem port is slot #2.

5. The disk drive will go on, saving the changes on the disk.

After the changes have been saved, you will be returned to the Extended Menu.

For best results in using speech feedback with any setup, the speech feedback in the overlay should have been written for the same type of synthesizer that you are using. If you are using a different type of synthesizer than the setup was created for, and you configure the Menu and Construction Disk for your synthesizer, you may need to use Make Changes ... Overlay to edit the USER HEARS for some or all of the items in that overlay.

If a setup was created for an Echo Speech Synthesizer, and you want to use an external synthesizer, you can edit just the USER HEARS items which do not sound correct.

If a setup was created for an external synthesizer, and you want to use an Echo, you'll need to edit every USER HEARS items in the overlay, so that the Echo phonemes for each item will be part of the overlay.

For more information about using AFC speech feedback, see Chapter 3.

OTHER OPTIONS: TRANSFER SETUPS

The TRANSFER SETUPS option lets you copy a setup from one AFC Menu Disk System 4.0 to another. This can be done in two ways:

- from one Menu Disk to another using a computer with one or two disk drives or
- over a distance with other AFC users by means of a modem, a terminal program which transfers binary files (such as Apple Access II, by Apple), and a bulletin board.

Note: If you have setups with a customized expanded keyboard or a customized scanning overlay on an earlier version of the AFC Menu Disk (System Software 3.0P or 3.0P2), you can use the transfer setups option to transfer these setups to your Menu Disk System 4.0. You cannot, however, do the reverse: you cannot transfer a setup from a Menu Disk System 4.0 to a Menu Disk System 3.0.

If the system software number for your Menu Disk is not on the label, you can get the information from the disk itself: When the Extended Menu for that disk is on the screen, press CONTROL-I for Information. From the list of topics, select VERSION INFO. The system software number for that disk will appear there.

COPYING SETUPS FROM ONE DISK TO ANOTHER

To copy a setup from one Menu Disk to another:

1. **Boot a Menu Disk System 4.0 or later.**
2. **Select OTHER OPTIONS** from the end of the Extended Menu.
3. From the Other Options Choices window, **select TRANSFER SETUPS.**

TRANSFER SETUPS

You may transfer setups

- 1 - from one AFC Menu Disk to another
- 2 - via modem to/from a bulletin board

Please select one.

Press ESC to exit.

4. From the Transfer Setups page, select **FROM ONE AFC MENU DISK TO ANOTHER.**

TRANSFER SETUPS

How many disk drives do you want to use?

- 1 - SINGLE DRIVE
- 2 - TWO DISK DRIVES
- 3 - HELP

Use arrows plus RETURN to select

Press ESC to exit.

5. The screen will change to ask how many disk drives you want to use. **Move the cursor to your choice; press RETURN.**

If you have two disk drives, you will be able to place the source disk in one drive and the destination disk in another. If you have one disk drive, the program will prompt you when to insert or remove the different disks.

6. **Insert the SOURCE DISK** when prompted, then **press any key.**

SETUP-TRANSFER: SOURCE DISK
Please select setup to be transferred

TITLE	INPUT	DESCRIPTION
-------	-------	-------------

Normal

.....

S.Assisted

S.Unicorn

S.KingMini

S.Morse

S.Scan.ABC

S.Scan.ETA

S.ASCII

T.Assisted

T.Unicorn

7. The Extended Menu from the source disk appears, titled **SETUP-TRANSFER: SOURCE DISK.**

Move the cursor to the setup you want to transfer.

Press RETURN to see the Description window.

Press RETURN again to bring up the Choices window.

TITLE: Sample

CHOICES:

TRANSFER THIS SETUP

VIEW OTHER SETUPS

QUIT

8. If this is the setup you want to copy, select **TRANSFER THIS SETUP** from the Choices window.

TITLE: Sample

CHOICES:

SETUP READY TO TRANSFER

- Press RETURN when ready

- Press ESC to cancel

9. The front window will change to **SETUP READY TO TRANSFER**.

If you are using two drives, just press RETURN.

If you are using one drive, the window will prompt you to remove this disk and insert the DESTINATION DISK, then press RETURN.

SETUP-TRANSFER: DESTINATION DISK

TITLE	INPUT	DESCRIPTION
Mouse ETA		
Mouse ABC		
Expl-Mouse		
Make Faces		
Make F		
Sorter		
Space		
Top.Dra		
Scan L		
Sample		

The transferred setup has been added to the Extended Menu of this disk.

DO YOU WANT TO TRANSFER ANOTHER SETUP? (Y/N)

10. The setup will be transferred to the Extended Menu of the destination disk.

The screen asks **DO YOU WANT TO TRANSFER ANOTHER SETUP?**

If you respond Y, the program will ask you to insert the source disk.

If you respond N, the program will take you to the Extended Menu of the destination disk.

TRANSFERRING SETUPS THROUGH A BULLETIN BOARD

To send or receive setups through a bulletin board, you will need a modem, the phone number and any access codes necessary to use the bulletin board, and your own terminal program which is capable of transferring binary files, such as Apple Access II.

The steps involved in transferring setups through a bulletin board are as follows:

To TRANSMIT (upload) a setup

1. Use the AFC transfer program to convert the setup to a binary file.
2. Use your modem and terminal program to transmit the binary file to the bulletin board.

To RECEIVE (download) a setup

1. Use your modem and terminal program to download the binary file from the bulletin board.
 2. Use the AFC transfer program to convert the binary file into a setup and add it to the Extended Menu on your Menu Disk..
-

To convert an AFC setup to a binary file:

1. **Format a disk to store the binary file.** (See the instructions in the manual for your terminal program.)
2. **Boot a Menu Disk System 4.0 or later.**
3. **Select OTHER OPTIONS** from the end of the Extended Menu.
4. From the Other Options Choices window, **select TRANSFER SETUPS.**

TRANSFER SETUPS

You may transfer setups

- 1 – from one AFC Menu Disk to another
- 2 – via modem to/from a bulletin board

Please select one.

Press ESC to exit.

TRANSFER TO/FROM BULLETIN BOARD

Please select:

- 1 – CONVERT SETUP TO BINARY FILE
- 2 – CONVERT BINARY FILE TO SETUP
- 3 – EXPLANATION

Use arrows plus RETURN to select

Press ESC to exit.

TRANSFER TO/FROM BULLETIN BOARD

How many disk drives do you want to use?

- 1 – SINGLE DRIVE
- 2 – TWO DISK DRIVES
- 3 – HELP

Use arrows plus RETURN to select

Press ESC to exit.

5. From the Transfer Setups page, select **VIA MODEM TO/FROM A BULLETIN BOARD**.

6. The screen will change to ask if you want to **CONVERT SETUP TO A BINARY FILE** or the reverse. **Move the cursor to CONVERT SETUP TO BINARY FILE; press RETURN.**

7. The screen will change to ask how many disk drives you want to use. **Move the cursor to your choice; press RETURN.**

If you have two disk drives, you will be able to place the Menu Disk in one drive and the binary-file disk in another. If you have one disk drive, the program will prompt you when to insert or remove the different disks.

8. Insert the AFC Menu Disk when prompted, then **press any key**.

SETUP-TRANSFER: SOURCE DISK
Please select setup to be transferred

TITLE	INPUT	DESCRIPTION
-------	-------	-------------

Normal

.....

S.Assisted

S.Unicorn

S.KingMini

S.Morse

S.Scan.ABC

S.Scan.ETA

S.ASCII

T.Assisted

T.Unicorn

9. The Extended Menu from the source disk (the Menu Disk) appears, titled SETUP-TRANSFER: SOURCE DISK.

Move the cursor to the setup you want to transfer.

Press RETURN to see the Description window.

Press RETURN again to bring up the Choices window.

TITLE: Sample

CHOICES:

TRANSFER THIS SETUP

VIEW OTHER SETUPS

QUIT

10. If this is the setup you want to convert to a binary file, select **TRANSFER THIS SETUP** from the Choices window.

TITLE: Sample

CHOICES:

SETUP READY TO TRANSFER

- Press RETURN when ready

- Press ESC to cancel

11. The front window will change to SETUP READY TO TRANSFER.

If you are using two drives, just press RETURN.

If you are using one drive, the window will prompt you to remove this disk and insert the **BINARY-FILE DISK**, then press RETURN.

12. You will be asked to enter a name for the new binary file. (You can give it any name except the word CATALOG.) Enter a name, then press RETURN.

13. When the transfer is complete, the screen will ask **DO YOU WANT TO CONVERT ANOTHER SETUP?**

If you respond **Y**, the program will ask you to insert the AFC Menu Disk. It will then take you to step 9 above.

If you respond **N**, the program will ask you to insert the AFC Menu Disk and will take you to the Extended Menu of that disk.

To convert a binary file to an AFC setup:

1. Have the disk with the binary file available.
2. Boot a Menu Disk System 4.0 or later.
3. Select **OTHER OPTIONS** from the end of the Extended Menu.
4. From the Other Options Choices window, select **TRANSFER SETUPS**.

TRANSFER SETUPS

You may transfer setups

- 1 - from one AFC Menu Disk to another
- 2 - via modem to/from a bulletin board

Please select one.

Press ESC to exit.

5. From the Transfer Setups page, select **VIA MODEM TO/FROM A BULLETIN BOARD**.

TRANSFER TO/FROM BULLETIN BOARD

Please select:

- 1 - CONVERT SETUP TO BINARY FILE
- 2 - CONVERT BINARY FILE TO SETUP
- 3 - EXPLANATION

Use arrows plus RETURN to select

Press ESC to exit.

6. The screen will change to ask if you want to **CONVERT SETUP TO A BINARY FILE** or the reverse. Move the cursor to **CONVERT SETUP TO BINARY FILE**; press **RETURN**.

TRANSFER TO/FROM BULLETIN BOARD

How many disk drives do you want to use?

- 1 - SINGLE DRIVE
- 2 - TWO DISK DRIVES
- 3 - HELP

Use arrows plus RETURN to select

Press ESC to exit.

7. The screen will change to ask how many disk drives you want to use. **Move the cursor to your choice; press RETURN.**

If you have two disk drives, you will be able to place the Menu Disk in one drive and the binary-file disk in another. If you have one disk drive, the program will prompt you when to insert or remove the different disks.

8. Insert the AFC Menu Disk when prompted, then press any key.

SETUP-TRANSFER: SOURCE DISK Please select setup to be transferred

TITLE	INPUT	DESCRIPTION
Normal		
.....		
S.Assisted		
S.Unicorn		
S.KingMini		
S.Morse		
S.Scan.ABC		
S.Scan.ETA		
S.ASCII		
T.Assisted		
T.Unicorn		

9. The Extended Menu from the source disk (the Menu Disk) appears, titled SETUP-TRANSFER: SOURCE DISK.

Move the cursor to the setup you want to transfer.

Press RETURN to see the Description window.

Press RETURN again to bring up the Choices window.

TITLE: Sample

CHOICES:

- TRANSFER THIS SETUP
- VIEW OTHER SETUPS
- QUIT

10. If this is the setup you want to convert to a binary file, **select TRANSFER THIS SETUP** from the Choices window.

TITLE: Sample
CHOICES:
SETUP READY TO TRANSFER
- Press RETURN when ready
- Press ESC to cancel

11. The front window will change to **SETUP READY TO TRANSFER**.

If you are using two drives, just press RETURN.

If you are using one drive, the window will prompt you to remove this disk and insert the **BINARY-FILE DISK, then press RETURN.**

12. You will be asked to enter a name for the new binary file. (You can give it any name except the word **CATALOG**.) **Enter a name, then press RETURN.**
13. When the transfer is complete, the screen will ask **DO YOU WANT TO CONVERT ANOTHER SETUP?**

If you respond Y, the program will ask you to insert the AFC Menu Disk. It will then take you to step 9 above.

If you respond N, the program will ask you to insert the AFC Menu Disk and will take you to the Extended Menu of that disk.

CHAPTER 7

REFERENCE: ADDING A SETUP

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CHAPTER 7

REFERENCE: ADDING A SETUP

This reference chapter provides general information for planning and creating a setup on the AFC Menu Disk. Examples are available in the chapter for each input method.

You can add completely new setups to your Extended Menu. A setup must include a *method* (what you DO with the switch or keyboard to make a selection), a *rate* (how quickly you must manage the switch or keyboard), and an *overlay* (what the USER SEES and HEARS and what the COMPUTER RECEIVES when the input device is used).

Creating a setup is fairly easy, provided you have done some planning in advance. First, learn the application software, then decide what type of overlay should be in the setup. The first part of this chapter outlines the process of planning a setup and designing your own overlay. The second part describes the process of creating the setup and the overlay on disk. Specific examples are available in the chapters for each input method.

In addition to method, rate, and overlay, a setup may have enhancements particular to the application. Enhancements include *special options*, *macros*, *mouse emulation*, and *joystick/paddle emulation*. These are not covered in this chapter. If you are planning a setup for the first time, we suggest starting with the basics in this chapter or the chapter for your input method. When ready to plan a setup with enhancements, see Chapter 5 for special options, Chapter 17 for macros, Chapter 18 for mouse emulation, and Chapter 19 for joystick/paddle emulation.

PLANNING THE SETUP

When you plan a setup, you usually have in mind a specific user, specific application software, and specific reasons for using the computer.

For example, if you are a business person using scanning, you may be using sophisticated application software, such as AppleWorks. As you become more familiar with AppleWorks, you may want to add a setup for your particular use of that program. Your goals might include very exact use of the word processor, database, and/or spreadsheet.

If you are a teacher, parent, or therapist working with a young child who has cerebral palsy, you have a similar but very different set of factors to coordinate: the abilities of the user may, at this time, be more limited; the application software may be of a much simpler level; and the goals may have less to do with the software than with the user. Your goals, for example, may relate to developing motor or conceptual skills.

Essentially, designing a setup is a process of **coordinating the abilities of the user, the requirements of the application software, and the goal or purpose of using the application software.** Fortunately, this is not necessarily as complex as it sounds. The process can be broken down into several components, some of which will already be familiar to you. These components include:

- knowing the user
- knowing the abilities of the user with the input method
- knowing the goals of the computer activity
- learning the requirements of the application software
- planning a setup which coordinates these
- creating the setup on disk
- trying out the setup with the application software
- making revisions as needed

Planning and creating a setup may be done by a person who uses the computer keyboard or by a person who uses any AFC method with a standard or full-access overlay. Thus if you are an independent AFC user, you can design and create your own setups, *provided* you have your own setup with a full-access overlay in the #1 position on the Extended Menu, above the double-dotted line. (See "Having Your Setup Active at Startup," Chapter 6.)

Planning the Setup: Learn the Application Software

To create a setup for a particular application program, you must first **familiarize yourself completely with the application software**. This means running the application program by means of the computer keyboard or by an AFC setup with a standard overlay.

For example, if you wanted to create a setup for Alex the Rabbit, you would need to first become very familiar with the program.

Make a list of all keys and key combinations needed to run the program. This includes letters, numbers, special characters, control keys, etc. The best way to do this is to run the program and write down every key that is needed to run the program successfully:

- (1) **Write down every key needed, including RETURN and SPACEBAR.** Such keys, easily taken for granted, may be very important in your overlay.
- (2) **Watch for key combinations** which could be useful as items in the overlay or as macros. In a redefined or customized overlay, you can program an item to send **one character** to the computer or to send a combination or **string** of characters.

For example, if a program requires you to press RETURN after letters, this could be written down as a combination of each letter plus RETURN, making the user's task much simpler:

- A RETURN
- B RETURN
- C RETURN

Or RETURN may be designated as a separate single character, as in:

- A
- B
- C
- RETURN

As another example, an application program may require whole words as input. You could (1) plan an overlay which has all the individual letters,

or (2) plan an overlay where a single item actually sends a string (combination) of several characters.

In a word processing application such as AppleWorks, you could note combinations such as:

OPEN-APPLE DOWN-ARROW
OPEN-APPLE UP-ARROW

As you familiarize yourself with the application software, **write down keys as combinations if you think you may want to use them as combinations.** (You can always decide later not to use them as combinations.)

As an example, Figure 7-1 shows the keys required to operate Alex the Rabbit.

Figure 7-1. Keys Required in Alex the Rabbit

<u>Keys</u>	<u>Result</u>	<u>Comments</u>
RETURN	Starts the program	needed only once
UP ARROW	Moves Alex UP	essential
DOWN ARROW	Moves Alex DOWN	essential
LEFT ARROW	Moves Alex to the left	essential
RIGHT ARROW	Moves Alex to the right	essential
REPETITIONS	of ARROWS in 2's or 3's	might be useful
ANY NON-ARROW KEY	Alex wiggles his ears and says he "doesn't understand you."	not necessary but might be motivating

After carefully reviewing the application software, you are ready to plan your overlay.

Planning the Setup: Design the Overlay

This section describes a general approach, common to all input methods. If you are interested in one method in particular, please read, instead of this section, the "Create" section in the chapter for your method.

Once you are familiar with the application program, you can choose the items you need and decide the best type of overlay: standard, redefined, or customized.

STANDARD overlays are so called because they contain all the keys or characters on the Apple keyboard, arranged in a standard manner for general-purpose use with a particular input method.

The "S" setups on the Extended Menu contain the AFC standard overlays for each input method. These are discussed in detail in the chapter for each input method.

The standard overlays were intended for general use in situations where access to all keyboard characters is important — **virtually all commercial software will work with a standard overlay**. You simply use the standard overlay for your input method in place of the Apple keyboard. In many situations, however, you may want a different type of overlay, one which is more efficiently tailored to your particular application.

REDEFINED overlays are modifications of a standard overlay. For example, the location or definition of certain characters has been changed or additional levels of characters added.

The RedefMorse setup has the codes for SPACE and I reversed, so that SPACE is a very short code.

CUSTOMIZED overlays are created "from scratch" — and most likely do not resemble the standard overlay at all. They can be very complex or very simple, using only the characters or character combinations required to operate a particular application program. (Often this is a small subset of the entire alphabet.)

For example, the UP DOWN LEFT RIGHT overlay in the Up Down setup for Alex the Rabbit (Chapter 1) is very different

from the standard ABC scanning overlay (used in Chapter 2). While you *could* use a standard overlay to run Alex the Rabbit, a customized overlay makes a lot more sense.

If a one-level STANDARD overlay meets your needs, you can proceed immediately to "Creating the Setup on Disk." Designing a REDEFINED or a CUSTOMIZED overlay, however, is not difficult. The exact steps will vary with each input method, but, in general, the basic steps are:

- choose the *items* (the keyboard characters) you want to include
- choose the *type of overlay* (redefined or customized)
- decide how your items will be *arranged* within the overlay (such as which squares you will use on an expanded keyboard, or what codes you will use in Morse code)
- plan for each item:
 - how it *will appear* to the user (such as what symbol will be on the keyboard or what letter or word will appear on the scanning array)
 - what the *computer will receive* when that item is selected
 - what the *user will hear* (as speech feedback) when that item is selected (if this is a talking overlay)
- decide how to handle lost functions (if this is a redefined overlay)
- plan levels (or multiple arrays), if needed

CHOOSING THE ITEMS (KEYBOARD CHARACTERS)

Consider what you know about the abilities of the user with the input method, the goals of the computer activity, and the requirements of the application software. From this, **make a list of the keys or key combinations you want in the overlay.** The keys you choose could be the entire list you wrote down when reviewing the software, or a modification of that list, since you may not be planning on using all the keys required in the application software.

CHOOSING THE TYPE OF OVERLAY

If the standard overlay for your method is basically what you want, with some items rearranged or additional levels added, consider creating a

redefined overlay: you start with the standard overlay as your base and revise it or add levels as needed.

If the standard overlay does not resemble what you want, your best bet is to create a **customized** overlay: you will create it "from scratch."

At this time, you could also, consider whether you want the overlay (standard, redefined, or customized) to be a **talking** overlay, that is, do you want the overlay to include **speech feedback** from a speech synthesizer? This does *not* add speech to the application program, just to your AFC overlay. (You must have one of the speech synthesizers described in Chapter 3.)

With speech feedback for the expanded keyboard method, for example, when you press a square, a speech synthesizer "speaks" a character, word, or phrase *and* the AFC sends that square's characters to the computer to run the application program.

With speech feedback for Morse code, you send the *dit-dah* signals as usual, and the speech synthesizer speaks the name of each character you send.

With speech feedback for scanning, the items on the scanning overlay are "spoken" aloud by a speech synthesizer as the cursor moves from item to item. What you have, in effect, is a "talking" scanner.

DECIDING HOW THE ITEMS WILL BE ARRANGED

Deciding how the items will be arranged depends upon the input method, the user's abilities with the method, and the application. Decide how many and which locations on the overlay you want to use, then review the list of items you want to include, and decide which items to place where. Considerations include:

- Will some items be used more frequently than others? Are some locations on the overlay easier to reach than others? If so, put the more frequently needed items in the easier-to-reach parts of the overlay.

- Will some items make more sense or be easier to find in certain locations on the overlay?

A good way to map this out is to make a layout worksheet for your input method. Examples of worksheets are in the chapters for each input method — the main idea is that you plan your overlay in detail before creating it on disk. The worksheet helps you define what the **USER SEES**, what the **COMPUTER RECEIVES**, and, in a talking overlay, what the **USER HEARS** for each item, plus the expected **RESULT** in the application software. Where applicable, the worksheet can include a drawing which shows what the overlay will look like to the user.

IDENTIFYING HOW EACH ITEM WILL APPEAR TO THE USER

List each item on your worksheet according to how it will appear on the overlay — its location and/or how it will be identified by the user.

DEFINING WHAT THE COMPUTER WILL RECEIVE FOR EACH ITEM

Once you've listed the items by location and by appearance, you're ready to list the **COMPUTER RECEIVES** for each item on your worksheet. Using the original list of keyboard characters you wanted to include in the overlay, write down, for each item, the exact character or characters you want the **AFC** to send to the computer when that item is selected. Remember, this can be a **single character** or a **string** of up to 100 characters. Special keys, such as **ESC** or **RETURN** or **OPEN-APPLE**, can be included.

***CAUTION:** The important factor here is that the application program do what you want it to do when that item is selected — the **COMPUTER RECEIVES** for each item must be the character or sequence of characters required by the application program to produce the **RESULT** you desire.*

On your worksheet, fill in both the **COMPUTER RECEIVES** and the expected **RESULT** for each item. (Example worksheets are available in the chapter for each input method.)

CHOOSING WHAT THE USER WILL HEAR FOR EACH ITEM

If you are creating a talking overlay, you should also write down, for each item, what you want the speech synthesizer to say when that item is selected. You don't need to worry, at this point, about how the speech will sound. Once you are creating the overlay on disk, you will be able to hear what the speech sounds like.

In some applications, what the user hears could be the same as what the COMPUTER RECEIVES, such as the name of a letter. In other applications, the USER HEARS might make more sense if it is a modification of COMPUTER RECEIVES.

With a talking scanner, when and what the speech synthesizer "speaks" can be defined in two ways: what the USER HEARS as the cursor moves across the array (required) and the SPEECH FEEDBACK the user hears after an item is selected (optional).

DECIDING HOW TO HANDLE LOST FUNCTIONS (IN A REDEFINED OVERLAY)

If you are planning a redefined overlay, keep in mind that when you redefine an item in a standard level, the original standard-overlay COMPUTER RECEIVES for that item is no longer available in that level. When you plan redefined items, be sure to note the impact of the loss of the original meanings for your application program. (Make this part of your worksheet.)

If any of the original meanings are important in running the application program, various strategies are available to allow you to have redefined items *without* losing the important original meanings altogether. You can:

- **STAY WITH ONE LEVEL** and
 - select other items to redefine, rather than the ones you first planned, or
 - go with your original plan but redefine other items to be the lost original characters.

OR

- **USE MORE THAN ONE LEVEL**, retaining the original characters in one level (such as Level 1) and putting your redefinitions in a different level (such as Level 2).

The MORSE CODE chapter describes an example in which Level 2 was used for redefinitions rather than "lose" the standard items in Level 1.

PLANNING LEVELS (OR MULTIPLE ARRAYS)

In some applications, you may have reason to design an overlay which has more than one LEVEL. A typewriter keyboard, as an example, may be considered to have two levels: you use the SHIFT key to shift between levels.

When you use the lower level, you get lower-case letters or whatever character is lower on two-character keys, such as numbers, =, and /. When you SHIFT into the upper level, you get upper-case characters or whatever character is upper on two-character keys, such as !, @, #, \$, and ?.

With the AFC, you can have as many as ten levels in one overlay. You shift between levels by means of level-shift commands (from the Apple keyboard or through your input method.) As with a typewriter keyboard, what characters the computer receives when an item is selected depends on the level you are using at that time.

With scanning, the terms are different but the concepts are similar: you can have as many as ten arrays in one overlay. You branch between arrays by means of branching commands. The branching commands are usually part of the scanning overlay, but a trainer can also branch between arrays by means of the Apple keyboard.

Levels may be used in very different ways:

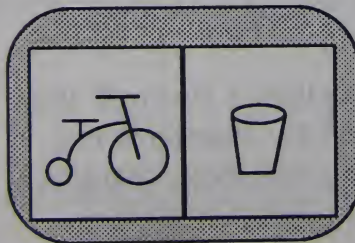
For a sophisticated AFC user:

- (1) Items could be stored in easy-to-reach level-2 locations, rather than hard-to-reach level-1 locations.

- (2) If level 1 is the alphabet, numbers, etc., you could have words, phrases, and command sequences stored on additional levels. This could speed output in some applications, such as when using a word processing program. (In this situation, you might also be interested in MACROS, Chapter 17.)

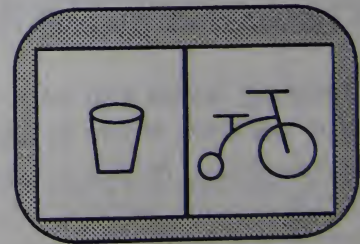
In a training situation:

- (1) Levels can be used to vary the activity frequently and easily. For example, if a trainer has several overlays in mind for one application program and wants to be able to change overlays quickly while using the application, the different overlays could be created as different levels in one AFC overlay. When using this multi-level overlay, the trainer can quickly shift levels without losing the application program and without changing setups. (The is the same effect as switching between different setups on the Quick-Start Menu — see Chapter 4.)
- (2) Levels can be used to change the location of items on the overlay. For example, the Drink Ride Unicorn setup on your Extended Menu includes a two-level overlay for the Unicorn Keyboard, for use with the TAG Sampler on the Sample Application Software disk. Level 1 corresponds to Paper Overlay #1, and Level 2 corresponds to Paper Overlay #2, as shown on the next page.



Paper Overlay #1

AFC OVERLAY Level 1:
Pressing the left half sends a T;
pressing the right half sends a G



Paper Overlay #2

AFC OVERLAY Level 2:
Pressing the left half sends a G;
pressing the right half sends a T

- (3) Levels can also be used to change the speech feedback — different levels in the overlay could generate different types of

speech feedback for the same COMPUTER RECEIVES — the trainer changes the speech feedback by simply shifting levels.

When you plan a multi-level overlay, you must:

- plan how the shifting between levels will occur — decide if it should be done from through the input method or from the Apple keyboard
- plan the COMPUTER RECEIVES and (optional) the SPEECH FEEDBACK for each item in each level

Shifting Between Levels

There are two ways to shift between levels:

FROM THE APPLE KEYBOARD:

Changing levels can always be accomplished directly from the Apple keyboard (CONTROL-A 5 plus the new level number — see Chapter 4). This is useful in applications, such as the Drink Ride Unicorn setup, where it is appropriate for the trainer, rather than the user, to change the levels — in such cases, dedicating items in the overlay for level-shift commands may not be necessary.

THROUGH THE INPUT METHOD:

Changing levels can also be accomplished through the input method, if the special AFC.LEVEL character has been included in the overlay. (If the AFC.LEVEL character is not part of the overlay, the only way to change levels is through the Apple keyboard.)

With scanning, branching capabilities can be built into the overlay by means of a special AFC.BRANCH TO character or through a WHAT NEXT arrangement for any array. Examples are given in the SCANNING chapter. The AFC.LEVEL characters, LOCK/REVERT status, and FALL-THROUGH status (discussed below) are not part of a scanning overlay.

LOCK/REVERT Status

If you define any items in your overlay to have the AFC.LEVEL character, you will also need to decide what should happen after the user selects a new level. **Should the AFC REVERT TO LEVEL 1** after a selection is made in the new level or **LOCK INTO THE NEW LEVEL** until the user deliberately selects another level?

If you choose the REVERT option, the user can still lock into a new level by selecting that level twice in a row. (For this to work, the complete AFC.LEVEL command must be available in each level of the overlay; for example, the ability to select AFC.LEVEL 2 must be in both Level 1 and Level 2 of the overlay.)

The LOCK/REVERT status relates only to use of the AFC input method to change levels. If the Apple keyboard is used, the new level will always be locked.

FALL-THROUGH Status

In a multi-level overlay, how do you want the AFC to handle the undefined items in Levels 2-10? The AFC can **leave the items undefined** or **use the Level 1 definition**. If you select "use the Level 1 definition," the undefined items on higher levels will "fall through" to Level 1; that is, they will have the same meaning as in Level 1. If you choose "leave items undefined," any items not defined in Levels 2-10 are null.

CREATING THE SETUP ON DISK

This section applies to all input methods except scanning. To create a setup with scanning, use "Creating the Setup on Disk" in the SCANNING chapter.

We assume you have already planned your own overlay and are ready to create it on disk. Steps which apply only to a particular input method are in small italics. For less detailed steps and an example for your input method, see "Creating the Setup on Disk" in the chapter for your method.

Before creating a setup on disk, it's helpful to have a quick overview of the process:

Extended Menu	→	Construction Programs	→	Extended Menu
(ADD A SETUP)		(CREATE, SAVE, QUIT)		(LOAD and use setup)

First you select ADD A SETUP from the bottom of the Extended Menu. This takes you to the setup Constructions Programs — you select a method and create an overlay. When done, you SAVE the setup on disk, then QUIT. Selecting QUIT takes you back to the Extended Menu, where you can LOAD the setup in the usual way and use it with an application.

You can use any Apple II computer, even if it does not have an AFC installed. It's much easier, however, to create a setup if an AFC and your input device are part of the system. The basic steps for adding a new setup to the Extended Menu begin on the next page.

GETTING STARTED

EXTENDED MENU OF AFC SETUPS

.....
.....
.....
.....

ADD A NEW SETUP
DELETE/COPY/REARRANGE
SIMPLIFY/EXPAND
OTHER OPTIONS
QUIT

1. Boot the Menu Disk.

Press '9' (or use SPACEBAR or ARROWS) to move the cursor to **ADD A NEW SETUP** (at the bottom of the Extended Menu).

Press RETURN.

AFC CONSTRUCTION PROGRAMS

CREATE A NEW SETUP WHICH USES:

- 1: EXPANDED OR MINIATURE KEYBOARD
- 2: SCANNING
- 3: MORSE CODE
- 4: ASSISTED APPLE KEYBOARD
- 5: MULTIPLE SWITCH BOX
- 6: ASCII INPUT
- 7: NORMAL INPUT

PLEASE INDICATE CHOICE AND PRESS RETURN
PRESS ESC TO RETURN TO EXTENDED MENU

2. A menu will appear, listing the AFC input methods.

Move the cursor to the method you want; press RETURN.

PLEASE ENTER A TITLE FOR THE NEW SETUP:

==> -----

(ENTER A TITLE IN THE SPACE ABOVE;
PRESS RETURN)

3. You will be asked to enter a title for the new setup. The limit is 10 characters.

Enter a title; press RETURN. If you don't enter a title, the setup will be given the title NONAME.

If you later want to change the title, select MAKE CHANGES IN SETUP from the Choices window, then select DESCRIPTION. The title of a setup is part of the Description.

*For the expanded keyboard method, a menu of input devices will appear.
You will be asked to select your device from this list:*

THE OVERLAY WILL BE:

- 1: CUSTOMIZED (you create completely)
- 2: STANDARD (same as standard overlay)
- 3: REDEFINED STANDARD (you modify)

(INDICATE CHOICE AND PRESS RETURN)

4. A listing and description of overlays will appear.

- To create a setup with the **standard overlay** for your method, select 2: STANDARD. The standard overlay will be loaded, and the TEST/SAVE/QUIT options will appear, as described later in this chapter. If you later want to make changes in the overlay, use the Make Changes window on the Extended Menu.
- To create a setup with a **redefined standard overlay**, select 3: REDEFINED STANDARD. The program will load the standard overlay and take you to the Create Overlay program, so you can immediately add levels or redefine the overlay as desired.

Examples for creating redefined overlays are available in the ASSISTED KEYBOARD and MORSE CODE chapters.

- To create an overlay **not based on the standard overlay**, select 1: CUSTOMIZED. This will take you to the Create Overlay program, described below.

Examples for creating customized overlays are available in the EXPANDED KEYBOARD, SCANNING, MULTIPLE SWITCH BOX, and ONE SWITCH, TWO SWITCH chapters.

If you select STANDARD, skip ahead to step 15, "Saving Your Work," below.

If you select REDEFINED, skip ahead to step 6, below.

If you select CUSTOMIZED, continue reading.

PLEASE SPECIFY SPEECH-FEEDBACK OPTION:

- 1: NONE
- 2: ECHO SPEECH SYNTHESIZER
- 3: EXTERNAL SYNTHESIZER

(INDICATE CHOICE AND PRESS RETURN)

5. A speech-feedback choice appears.

If you select NONE, you cannot later add speech feedback to this setup. If you select a synthesizer, this setup will be equipped for speech feedback, which you can turn off later, if you choose.

NOTE: A setup which includes speech feedback takes up 3-4 times as much memory on the AFC as a setup which does not include speech feedback. This influences how many setups fit on the Quick-Start Menu.

Move the cursor to your choice; press RETURN.

If you select a synthesizer that your disk is not configured for, the program will ask if you want the disk to be reconfigured. This will let your new setup — and all the other talking setups on this disk — use the new synthesizer. To change the configuration at a later time, you can use Other Options ... Change Speech at the end of the Extended Menu. (If you create a setup for one synthesizer, then later reconfigure the disk for a different type of synthesizer, you may need to edit the USER HEARS in the overlay — see page 3-7.)

For expanded keyboard, if you selected Unicorn as your input device, a page will appear listing various special layout options, as described in the EXPANDED KEYBOARD chapter. To see what a layout looks like, move the cursor to the layout and press D (for Description). To select a layout, move the cursor to the layout; press RETURN. Once you have selected a layout, you cannot change your choice. The option to CREATE YOUR OWN LAYOUT, described in the EXPANDED KEYBOARD chapter, is the last choice on the list.

For Morse code, you will be asked to select the Morse code method and a rate.

CREATE OVERLAY: MAIN MENU

Please select:

1 - WORK WITH OVERLAY

2 - USE LEVELS

3 - LIST CONTENTS

4 - TEST/SAVE/QUIT

Use arrows plus RETURN to select

6. The Create Overlay Main Menu appears.

To begin creating, press RETURN when the cursor is on WORK WITH OVERLAY.

7. If your AFC is turned off, you will be prompted to turn it on.

BASIC STEPS

You are now ready to begin "defining" or "programming" the AFC overlay. The basic steps for each item will be (don't do this yet):

- (1) Indicate item user will select.
- (2) Enter characters computer receives.
- (3) Enter speech feedback user hears (if you opted for speech feedback).
- (4) When you have programmed a good part of the overlay, select TEST/SAVE/QUIT and SAVE your work to disk.

INDICATE ITEM USER SELECTS

(1) INDICATE ITEM USER SELECTS:

- Instructions for indicating item
- or -
- Press <ESCAPE> for MAIN MENU

((LEVEL 1 - FREE MEMORY ####))

8. Step (1) is INDICATE ITEM USER SELECTS. You may define items in any order.

The instructions on the screen will be tailored to your input method, eg. "Touch square user touches," "Indicate code user sends," etc.

Indicate the first item you want to define.

How you "indicate" items will depend on your input method — prompts will appear on the screen.

For assisted keyboard, press the key on the Apple keyboard that the user will press. For expanded keyboard, touch the square the user will touch. For Morse code, use switches or the OPEN-APPLE and OPTION/SOLID-APPLE keys to send the code the user will send. For multiple switch box, press the switch the user will press.

If your input device or the AFC are not available, you may still be able define the overlay, according to instructions in the chapter for your input method.

(1) USER SELECTS: (Key, code-name, etc.)

(2) ENTER CHARACTERS COMPUTER RECEIVES:

Use these commands to edit your entry:

<ESCAPE> = special characters
<ARROWS> = move cursor
<DELETE> = erase one character
<CTRL-X> = erase entire entry
<RETURN> = done

9. The screen changes to show the item you indicated.

For assisted keyboard, this will be the name of the key. For expanded keyboard or multiple switch box, the AFC's code-name for that square or switch. For Morse code, the sequence of dit-dah signals, shown as dots and dashes within brackets.

Step (2) will be ENTER CHARACTER COMPUTER RECEIVES. Please read below.

ENTER CHARACTERS COMPUTER RECEIVES

COMPUTER RECEIVES is the character or characters which will go to the computer when the user selects a certain item from the AFC overlay. The procedure for entering COMPUTER RECEIVES is usually straightforward: **enter the characters you want the computer to receive; then press RETURN.**

If you want the computer to receive the letter 'A,' just press A, then press RETURN. If you want the computer to receive the word "COMPUTER," press the letters C O M P U T E R, then RETURN.

Special considerations are upper- versus lower-case characters and using special characters, such as RETURN or CONTROL or NUMERIC KEYPAD characters. These are discussed below.

Upper versus Lower Case

1. If your application software requires upper-case letters (such as "THE" and not "the" — this is frequently true of educational software), **be sure to enter the COMPUTER RECEIVES characters in upper case ("A").** When you later use this overlay, the characters sent to the computer will then be in upper case, regardless of whether the AFC CAPS-LOCK function is on or off.

2. **If your application software accepts both upper-case and lower-case letters (such as a word processor), enter the COMPUTER RECEIVES characters in the upper- or lower-case desired (such as "Saturday").** When you later use this overlay, the characters ("Saturday") will be sent as you entered them, provided the AFC CAPS-LOCK function has been toggled off. If the AFC CAPS-LOCK function is on, the characters will be sent in all upper case ("SATURDAY").
3. **If you are programming an overlay with single letters (rather than words), you need not worry about upper- versus lower-case.** Single letters in a customized overlay will be sent to the computer as upper case ("A") if AFC CAPS LOCK is on and as lower case ("a") if AFC CAPS LOCK is off.

More information on AFC CAPS LOCK is available in the "Using ..." section of the chapter for your input method.

Special Characters

To place special characters, such as RETURN or LEFT ARROW, in COMPUTER RECEIVES, use the special-character window:

(1) USER SELECTS: (Key, code-name, etc.)

(2) ENTER CHARACTERS COMPUTER RECEIVES:

☐

INSERT SPECIAL CHARACTER
(USE ARROWS + RETURN)

<NONE>
<ESCAPE>
<RETURN>
<SPACE>
<LEFT ARROW>
<RIGHT ARROW>
<UP ARROW>
<DOWN ARROW>
<TAB>
<DELETE>
<CTRL-X>
<CTRL-Y>
<COMMAND/OPEN.APL>
<OPTION/SOLID.APL>
<CONTROL>
<CAPS-LOCK>
<SHIFT>
<NUM.KEYPAD>
<RESET>
<AFC.REPEAT>
<AFC.LEVEL>
<AFC.MACRO>
<AFC.MOUSE>
<AFC.NULL>

1. Press ESC.
2. The special-character window will appear. You can scroll through the window in the usual way, or you can press numbers (1-9) to move to various points along a special-character ruler. (9=end, 1= beginning, 3=1/3 down, etc.)
3. Move the cursor to the desired special character; press RETURN.

The name of that character (or an abbreviation) will be displayed in the COMPUTER RECEIVES line.

If a character is not in the special-character window, it is not really "special." To enter any character not in this window, simply press, send, or select that character in the usual way.

NOTE: SPACE, TAB, UP and DOWN ARROWS are not really special characters. They appear in the special-character window because many people expect them to be there. You can enter them in COMPUTER RECEIVES by simply pressing those keys on the Apple keyboard.

When you select a special character or press SPACEBAR, TAB, UP or DOWN ARROW, the COMPUTER RECEIVES line will show the name of that character in <brackets>. The name and the < > are generated by the Overlay Create program to let you know you have entered that character into what the computer will receive. **Do not try to enter such characters by typing the name yourself and putting it in brackets** — while this will look the same on the screen, the COMPUTER RECEIVES will not work correctly with your application program.

CONTROL-Characters

Most CONTROL- characters can be entered as-is by holding down the CONTROL key and pressing the associated character key. The exceptions are CONTROL-X and CONTROL-Y, which are available through the special-character window.

NUMERIC-KEYPAD Characters

To enter a numeric-keypad character, first enter NUM.KEYPAD from the special-character window, then enter the character itself, such as 1, 2, +, -.

For the ENTER character, use the special-characters NUM.KEYPAD + RETURN.

For the CLEAR character, use the special-characters NUM.KEYPAD + CTRL-X.

ENTER SPEECH FEEDBACK USER HEARS

10. If you selected a speech synthesizer, the program will take you to step (3): ENTER SPEECH FEEDBACK USER HEARS. If you selected "none" for speech feedback, skip to step 11 below.

(1) USER SELECTS: (Key, code-name, etc.)

(2) COMPUTER RECEIVES:
<UP ARROW>

(3) ENTER SPEECH FEEDBACK USER HEARS:
(same)

Use these commands to edit your entry:

<ARROWS> = move cursor
<DELETE> = erase one character
<CTRL-X> = erase entire entry
<RETURN> = done

If you want **USER HEARS** to be the same as what the computer receives, just press **RETURN**.

In the case of special characters, such as **UP ARROW**, "same" means no speech feedback.

If you want **USER HEARS** to be different from **COMPUTER RECEIVES**, just enter the speech you want the user to hear, then press **RETURN**.

PROCEED TO NEXT ITEM

(1) USER SELECTS: (Key, code-name, etc.)

(2) COMPUTER RECEIVES:
<UP ARROW>

(3) USER HEARS:
Up

(Press <SPACE> to hear speech)

1 - PROCEED TO NEXT ITEM
2 - MODIFY 'COMPUTER RECEIVES'
3 - MODIFY 'USER HEARS'
4 - RETURN TO MAIN MENU

11. The screen changes.

- **WITHOUT** speech feedback, the screen shows 'User Selects' and 'Computer Receives.'
- **WITH** speech feedback, the screen also shows 'User Hears.' Your speech synthesizer will speak the entry for 'User Hears.'

Press SPACEBAR to hear the speech again.

Your choices at this point are on the bottom of the screen. If everything is as you want it, just **press RETURN to proceed**.

To modify **COMPUTER RECEIVES** or **USER HEARS**, move the cursor to the desired choice and press **RETURN**. This will be described under "Changing or Deleting Entries," below.

PROGRAM EACH ITEM IN THE OVERLAY

12. Repeat steps 8-11 for each item in your overlay.

CHANGING OR DELETING ENTRIES

(1) USER SELECTS: (Key, code-name, etc.)

(2) COMPUTER RECEIVES:
<UP ARROW>

(3) USER HEARS:
Up

=====

(Press <SPACE> to hear speech)

1 - PROCEED TO NEXT ITEM

2 - MODIFY 'COMPUTER RECEIVES'

3 - MODIFY 'USER HEARS'

4 - RETURN TO MAIN MENU

13. To change or delete an entry:

When you finish programming an item, or when you indicate an item already programmed, the bottom of the screen will give you the 'Proceed ... Modify' options shown at left.

To change or delete COMPUTER RECEIVES or USER HEARS, move the cursor to that choice and press RETURN.

(1) USER SELECTS: (Key, code-name, etc.)

(2) ENTER CHARACTERS COMPUTER RECEIVES:
<UP ARROW>

(3) USER HEARS:
Up

=====

Use these commands to edit your entry:

<ESCAPE> = special characters

<ARROWS> = move cursor

<DELETE> = erase one character

<CTRL-X> = erase entire entry

<RETURN> = done

The screen will change to allow you to edit the existing entry.

To clear the whole entry, use CONTROL-X. To clear the entry from the cursor to the end, use CONTROL-Y.

To modify the entry, use ARROWS to move the cursor, then insert new text.

To delete characters, move the cursor to the right of the character, press DELETE.

When done editing this entry, press RETURN.

LISTING CONTENTS

14. You can get a listing of what you have programmed by returning to the Main Menu, then selecting LIST CONTENTS.

To return to the Main Menu, select RETURN TO MAIN MENU from the bottom of the Computer Receives or User Hears page or press ESC when the screen says 'Indicate item user selects.'

CREATE OVERLAY: MAIN MENU

Please select:

- 1 - WORK WITH OVERLAY
- 2 - USE LEVELS
- 3 - LIST CONTENTS**
- 4 - TEST/SAVE/QUIT

From the Main Menu,
select LIST CONTENTS.

Please select:

- 1- DISPLAY ON SCREEN
- 2- SEND TO PRINTER

You can select
DISPLAY ON SCREEN
or
SEND TO PRINTER.

NUMBER OF LEVELS IN USE = 1

LEVEL 1

< D5 >	= <LEFT ARROW>
SPEECH	= Left
< H1 >	= <UP ARROW>
SPEECH	= Up
< H5 >	= <DOWN ARROW>
SPEECH	= Down
< L5 >	= <RIGHT ARROW>
SPEECH	= Right
< P5 >	= <RETURN>
SPEECH	= (same)

A listing will appear,
arranged by level number.
The items will be listed
according to the key, code-
name, or code sequence for
each item in the overlay.

*The code-names shown at left are
for squares on an expanded key-
board. The AFC's code-names for
squares on an expanded keyboard
or for switches in a multiple
switch box are explained in the
chapters for those methods.*

FREE MEMORY

(1) INDICATE ITEM USER SELECTS:

- * Instructions for indicating items
- or -
- * Press <ESCAPE> for MAIN MENU

((LEVEL 1 - FREE MEMORY ####))

15. Whenever the screen says "Indicate item user selects," a **FREE MEMORY** number will be shown at the bottom of the screen.

Free memory is the maximum amount of memory left to use in the setup you are creating.

When your setups are small, you can fit as many as twenty on the Quick-Start Menu without difficulty. When your setups are larger (use up more memory), you may be limited to a smaller number on the Quick-Start Menu at any one time.

Some memory is used up whenever you use additional characters or levels in the overlay. The more characters or more levels you use, the more memory you use, but in most cases you will not come close to using up all the free memory.

An overlay with speech uses more memory than an overlay without speech.

For example, a talking standard overlay with speech feedback for the Echo takes up about five times as much memory as a standard overlay without speech feedback. A talking overlay with speech feedback for an external synthesizer uses up less memory than Echo speech feedback but more memory than a non-talking overlay.

If you were to use all the free memory while creating the overlay, your setup would be so large that you could not add MACROS or MOUSE TABS. The setup would also be so large that with this setup on the Quick-Start Menu, no other setups could fit on the Quick-Start Menu at the same time.

SAVING YOUR WORK

16. You *must* save your work before turning off the computer, or it will all be lost. It is also a good idea to save your work fairly often (such as every 10 minutes), even if you are not ready to quit. To save the setup you are working on:

Get the Create Overlay Main Menu on the screen. (Select RETURN TO MAIN MENU from the 'Proceed ... Modify' options or press ESC when the screen says "Indicate item user selects.")

CREATE OVERLAY: MAIN MENU

Please select:

- 1 - WORK WITH OVERLAY
- 2 - USE LEVELS
- 3 - LIST CONTENTS
- 4 - TEST/SAVE/QUIT

**From the Main Menu,
move the cursor to
TEST/SAVE/QUIT; press
RETURN.**

TITLE: Sample
METHOD: NAME OF METHOD
RATE: (number)

PLEASE SELECT:

- 1 - TEST IT!
- 2 - CHANGE METHOD/RATE
- 3 - CONTINUE EDITING/CREATING
- 4 - SAVE TO DISK
- 5 - QUIT

You will see a screen with choices. The title, method, and rate for your setup appear at the top, followed by five choices.

- 1 - TEST IT!
- 2 - CHANGE METHOD/RATE
- 3 - CONTINUE EDITING/CREATING
- 4 - SAVE TO DISK
- 5 - QUIT

**To save your work, select
SAVE TO DISK.**

SAVING SETUP

You will see SAVING SETUP while the new setup is being saved on the Menu Disk.

You will be returned to the page of choices.

TEST IT!

17. To check your work as you go along, **bring up the Main Menu** (described above), **select TEST/SAVE/QUIT, then:**

```
1 - TEST IT!  
2 - CHANGE METHOD/RATE  
3 - CONTINUE EDITING/CREATING  
4 - SAVE TO DISK  
5 - QUIT
```

select TEST IT!.

```
TITLE: Sample  
METHOD: NAME OF METHOD  
RATE: (number)
```

```
-----  
TEST RUN: Press ESC to exit Test Mode  
-----
```

- Instructions for selecting items
- Text will appear in the window below

```
++++++++  
+  
++++++++
```

A TEST RUN page appears. You must have an AFC and an input device to use the Test Run page.

For Morse code or scanning, you can use the OPEN-APPLE and OPTION/SOLID-APPLE keys in place of switches. For multiple switch box, you must have switches connected.

Use your input method to select items from your overlay – the correct COMPUTER RECEIVES should appear in the test window.

NOTE: In TEST RUN mode, the TAB character produces no result. The DELETE character produces a shaded item. The CONTROL character and all other characters will operate. When testing ARROW characters, the cursor

should move in the correct direction, provided it has room to move (eg., it can't move up or left from the starting position.).

When done testing, press ESC. You will be returned to the page of choices.

CHANGE METHOD/RATE

18. To change the method or rate, **select TEST/SAVE/QUIT** from the Main Menu, **then:**

- 1 - TEST IT!
- 2 - CHANGE METHOD/RATE**
- 3 - CONTINUE EDITING/CREATING
- 4 - SAVE TO DISK
- 5 - QUIT

select CHANGE METHOD/RATE and set the method and rate from the choices given.

CONTINUE EDITING/CREATING

- 1 - TEST IT!
- 2 - CHANGE METHOD/RATE
- 3 - CONTINUE EDITING/CREATING**
- 4 - SAVE TO DISK
- 5 - QUIT

19. To return to the Create Overlay Main Menu, **select CONTINUE EDITING/CREATING.**

QUITTING

20. When done with the setup, **select TEST/SAVE/QUIT** from the Main Menu, **then:**

- 1 - TEST IT!
- 2 - CHANGE METHOD/RATE
- 3 - CONTINUE EDITING/CREATING
- 4 - SAVE TO DISK
- 5 - QUIT**

select QUIT.

If you have made changes since the last save, you will be asked if you want to save or throw out the changes.

- 1 - CREATE ANOTHER SETUP
 - 2 - EXIT TO EXTENDED MENU

After quitting, two choices appear. To load and use the setup with application software or to write the description for the Description window, **select EXIT TO EXTENDED MENU**

If you got here by mistake, just press ESC to back up.

If, while using the Create Overlay program, you added an AFC.MACRO character to the overlay, the above window will also offer the choice **WORK WITH AFC MACROS**. (See Chapter 17 for details about macros and the Macro Manager program.)

MULTIPLE LEVELS

21. An AFC overlay may have up to ten levels of **COMPUTER RECEIVES** for each item.

Programming a New Level

(1) INDICATE ITEM USER SELECTS:

- * Instructions for indicating item
 - or-
 - * Press <ESCAPE> for MAIN MENU

((LEVEL 1 - FREE MEMORY ####))

The level you are programming is shown in the lower left of the **INDICATE ITEM USER SELECTS** pages.

To change to a different level in your overlay, press ESC to return to the Main Menu.

CREATE OVERLAY: MAIN MENU

Please select:

- 1 - WORK WITH OVERLAY
-
- 3 - LIST CONTENTS
- 4 - TEST/SAVE/QUIT

**From the Main Menu,
select USE LEVELS.**

USE LEVELS

Please select:

-
- 2 - ADD REFERENCE NAMES
- 3 - SET LOCK/REVERT STATUS
- 4 - SET 'FALL-THROUGH' STATUS
- 5 - RETURN TO MAIN MENU

**From the USE LEVELS
page, select CHANGE
LEVELS.**

Which level of the overlay
do you want to work with?

- Level #1
-
- Level #3
- Level #4
- Level #5
- Level #6
- Level #7
- Level #8
- Level #9
- Level #10

Use arrows plus RETURN to select
Press ESCAPE to return to MAIN MENU

**A page appears, listing the 10
possible levels, by number.**

**Move the cursor to the
level you want to work
with, then press RETURN.**

(1) INDICATE ITEM USER SELECTS:

- Instructions for indicating item
-or-
- Press <ESCAPE> for MAIN MENU

((LEVEL 2 - FREE MEMORY ####))

The INDICATE ITEM page will appear, with the new level number displayed at the bottom.

You are now ready to indicate the item you want to program in the new level.

You will stay in this level until you return to the Main Menu and select USE LEVELS ... CHANGE LEVELS again.

Programming Change-Level Items

When you are *using* a multi-level overlay, there are two ways to shift between levels: from the Apple keyboard (by a teacher or trainer) or through the AFC input method. To shift levels through the input method, one or more items must be programmed to contain a special AFC character called AFC.LEVEL. This character is available in the special-character window. (In a scanning setup, this character is called AFC.BRANCH TO.)

You may program an item to contain only the AFC.LEVEL character (in which case the user must next select a number item), or you may program an item to contain both AFC.LEVEL and the new level number.

To enter the AFC.LEVEL character (by itself or followed by a number):

1. Select the desired item.
2. For COMPUTER RECEIVES, press ESC to bring up the special-character window, then select AFC.LEVEL. (This character is near the end of the list — to get close to it quickly, press '9'.)
3. If you want the new-level number to be part of this item, add the number of the new level, then press RETURN.

For example, if you want selecting one item to result in a shift to Level 2, you can define COMPUTER RECEIVES for that item to be "<AFC.LEVEL>2."

NOTE: If the number of the new level is 10, the character following AFC.LEVEL should be '0' (ZERO), rather than '10'.

Setting the LOCK/REVERT Status

If you define any items in your overlay to have AFC.LEVEL characters, you will also need to decide what should happen after the user selects a new level. **Should the AFC REVERT TO LEVEL 1** after a selection is made in the new level or **LOCK INTO THE NEW LEVEL** until the user deliberately selects another level?

To set the LOCK/REVERT status:

1. Bring up the Create Overlay Main Menu.
2. Select USE LEVELS.
3. From the Use Levels page, select SET LOCK/REVERT STATUS.

SET LOCK/REVERT STATUS

Please specify what should happen after
a new level is selected:

- 1 - LOCK INTO NEW LEVEL
- 2 - REVERT TO LEVEL 1

Note: if you select (2), the level will
automatically return to level 1 after
you make a selection on the new level.

If you wish to lock into the new level,
you may still do so by selecting that
level twice in a row.

If you choose REVERT, the user
can still lock into a new level by
selecting that level twice in a
row. (For this to work, the
complete AFC.LEVEL command
must be available in each level
of the overlay.)

**Move the cursor to your
choice; press RETURN.**

The LOCK/REVERT choice pertains only to using the AFC input method to change levels. If the Apple keyboard is used (by means of CONTROL-A 5, described in Chapter 4), the new level will always be locked.

Setting the 'FALL-THROUGH' Status

How do you want the AFC to handle undefined items in Levels 2-10? The AFC can leave the items undefined or use the Level 1 definition.

To set the 'FALL-THROUGH' status:

1. Bring up the Create Overlay Main Menu.
2. Select USE LEVELS.
3. From the Use Levels page, select SET 'FALL-THROUGH' STATUS.

SET 'FALL-THROUGH' STATUS

How do you want undefined items on levels 2, 3 . . . to be handled?

- 1 - USE THE LEVEL 1 DEFINITION
- 2 - LEAVE ITEMS UNDEFINED

In case #1, the undefined items on higher levels will 'fall through' to level 1. In effect, all levels will behave like redefined copies of level 1.

If you select "use the Level 1 definition," the undefined items on higher levels will "fall through" to Level 1, that is, they will have the same meaning as in Level 1. If you choose "leave items undefined," any items not defined in Levels 2-10 are null.

Move the cursor to your choice; press RETURN.

Adding Level Names

In a multiple-level overlay, you can add REFERENCE NAMES for each level.

To add or change level reference names:

1. Bring up the Main Menu.
2. Select USE LEVELS.
3. Select ADD REFERENCE NAMES.

ADD LEVEL REFERENCE NAMES

Please select a level you wish to name:

Level #1	Standard characters
Level #2	Name, address, etc
Level #3	
Level #4	
Level #5	
Level #6	
Level #7	
Level #8	
Level #9	
Level #10	

DONE

A page for adding level reference names appears.

To add or change level names, **move the cursor to the level number and press RETURN.**

When done working with level names, **select DONE or press ESC.**

Activating or Deactivating Levels

To activate a level (up to 10), simply select that level and define one item (described in "Programming a New Level," above).

To deactivate a level, select that level and use CONTROL-X to delete the COMPUTER RECEIVES for each programmed item in that level, one at a time. (See "Changing or Deleting Entries," above.)

For examples of creating a redefined or customized overlay, see the chapter for your input method in Part II of this manual.

For information about adjusting special options, see Chapter 5.

For information about adding macros, using mouse emulation, or using joystick/paddle emulation, see Chapters 17, 18, and 19, respectively.

CHAPTER 8

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CHAPTER 8

THE ASSISTED IIGS KEYBOARD

This chapter will provide detailed information about the assisted keyboard method, including understanding the underlying method, using the standard overlay, and creating your own setups and overlays. We assume you have read the Introduction and Chapters 1-2 and have used the hands-on demos in those chapters. A quick view of the assisted keyboard method is available in Chapter 3.

This chapter applies only if you are using an Apple IIGS with a detachable keyboard. If you are using an Apple IIe upgraded to an Apple IIGS (where the keyboard is not detachable), this chapter does NOT apply: please contact Don Johnston Developmental Equipment, Inc. for information.

WHAT IS AN "ASSISTED" IIGS KEYBOARD?

The AFC "assisted" keyboard was designed for the person who uses the **Apple keyboard** but who types with a single finger, headwand, or mouthwand. Because the architecture of detachable and non-detachable keyboards are quite different, the AFC handles the two types of keyboards differently. The **assisted IIGS method** described in this chapter applies to the **Apple IIGS detachable keyboard**.

If you have tried using the Apple keyboard with a single finger or wand, you may have noticed the following difficulties:

SIMULTANEOUS KEYS — With one finger or wand, it is impossible to hold down two or three keys at the same time, such as SHIFT-4 to get a dollar sign or CONTROL-OPEN-APPLE-RESET to boot a disk.

AUTO-REPEAT — If you hold your finger or wand on a key for too long, the computer automatically (and very quickly) repeats the character, sometimes giving you a string of letters you do not want.

ACCIDENTAL KEYPRESSES — Using a wand or a single finger, it is often easy to touch extraneous keys accidentally, which may give you letters you don't want.

The AFC assisted keyboard method provides software latching for the SHIFT, CONTROL, COMMAND/OPEN-APPLE, and OPTION/SOLID-APPLE keys in a way that does not require holding down more than one key at a time. It also modifies the AUTO-REPEAT of the Apple IIGS: if you press a key three times, the *third press*, rather than the first or second, will enable a character to repeat. In addition, the RATE for the assisted keyboard method provides a keypress-delay time, which helps eliminate accidental keypresses. The keypress delay and rate of repeat are separately adjustable by the user.

Overlays

With the assisted keyboard method, OVERLAY means how letters or characters are defined on the Apple keyboard.

The STANDARD assisted keyboard overlay is simply the unmodified arrangement of letters and characters on the Apple keyboard.

REDEFINED and CUSTOMIZED assisted keyboard overlays, on the other hand, can include a rearrangement of letters on the Apple keyboard or the placing of strings of characters "under" certain keys. Examples include:

- changing the letters to be in alphabetical order
- making all the top keys be UP ARROW, the bottom keys be DOWN ARROW, left keys be LEFT ARROW, etc.
- moving the numbers to the bottom row
- adding RETURN to each letter and number (for an application program where the required response is a letter or number, followed by RETURN)
- putting the user's whole name under one key, such as the 'J' (for a program which asks the user's name and never requires the 'J' key.)

Some of these examples are available on your Extended Menu. Look for setups that say ASST (assisted keyboard) as input and read the Description windows.

Any assisted keyboard overlay can have up to ten LEVELS of characters on any key. To shift between levels, you can use CONTROL-A 5 (see Chapter 4), or you can redefine a key, such as the '[' key or any convenient key, to be a special AFC.LEVEL character.

The difference between standard, redefined, and customized overlays is this: In a *standard* or *redefined* overlay, you start with the standard overlay. You can then redefine any of the keys on any level; keys you don't change remain standard. In a *customized* overlay, you start from scratch; keys you do not redefine are null — they provide no input to the computer.

Optional SPEECH FEEDBACK can be part of any assisted keyboard overlay. With this option active, the speech synthesizer "speaks" a particular character, word, or phrase after the key is pressed. What you have, in effect, is a "talking" Apple keyboard.

The AFC speech feedback option allows **the addition of speech feedback to an assisted keyboard overlay** but does *not* add speech to the application program.

For information about using the speech feedback option, see "Using AFC Speech Feedback," Chapter 3.

Readings

Additional ideas for assistance in using a standard keyboard are available in:

Burkhart, L.J. *Using Computers and Speech Synthesis to Facilitate Communicative Interaction with Young and/or Severely Handicapped Children*. Linda J. Burkhart, 8503 Rhode Island Ave., College Park, MD 20740 (1987).

Wright, C. and Nomura, M. *From Toys to Computers: Access for the Physically Disabled Child*. Christine Wright, PO Box 700242, San Jose, CA 95170 (1985).

USING THE S.ASSISTED OR T.ASSISTED SETUP

In this section, you will use the assisted keyboard method with its standard overlay. Even if you are sure you do not wish to use the standard overlay, we recommend using this section to understand the assisted keyboard method.

Getting Started

To use this section as a hands-on tutorial, you will need:

- An Adaptive Firmware Card, already installed
- Your copy of the AFC Menu Disk
- The detachable Apple IIGS keyboard

Using the Assisted Keyboard

The plan will be:

- (1) Select the **S.ASSISTED** (standard assisted) or **T.ASSISTED** (talking standard) setup from the Extended Menu.
- (2) Use the Make Changes window to set the rate to 7.
- (3) Load the revised setup and bring up the test window.

To do this, you can use the quick steps below or, for more detailed instructions, leave a marker here and go to "Using an 'S' or 'T' Setup" in Chapter 6. Read that section until you see a row of stars (***), then return here.

Quick Steps:

1. Boot the AFC Menu Disk.
2. Move the cursor to the S.ASSISTED (or T.ASSISTED) setup; press RETURN.
3. Press RETURN again to get the Choices window on the screen.
4. Select MAKE CHANGES IN SETUP.
5. Select METHOD/RATE.
6. Respond Y to the caution window, then change the rate to 7.

7. When the Choices window reappears, select **LOAD THIS SETUP**.
 8. When the **SETUP IN EFFECT** window appears, press **T** to Test the setup.
-

When the test window appears, you are ready to try out the assisted keyboard.

If you are not a single-finger or wand typist, we suggest you use a single finger or a pencil, as if this were your method of using the keyboard.

1. **Type a few letters.** The letters you type will appear in the test window.

Notice that the keys don't trigger as quickly as you may be used to. (If you want to feel the usual keypress time, just turn the **AFC OFF** and type some letters. Then turn the **AFC ON** and feel the keypress delay.)

The idea behind the keypress delay is to help eliminate accidental keypresses for a person who is using a headwand or mouthwand. The keypress-delay time is governed by the **RATE** in that setup (in this case, a rate of 7). A rate of 1 is a very slow; rates of 15 or higher have no delay time.

To let you know when you have held the key long enough for the character to register, the **AFC** provides an audible click, which we call "click feedback." This click can be turned on or off in any setup by adjusting the special option of **CLICK FEEDBACK**. (See Chapter 5.)

Special Functions

MODIFIED REPEAT

The **AFC** assisted keyboard method modifies the Apple **IIGS's** **AUTO-REPEAT** — when you press a key once or twice, it will register only once with each press, no matter how long you stay on it — **if you press a key three times, the third press will enable an AUTO-REPEAT.**

1. **Select the character you want to repeat, such as 'x.'**
2. **Press the key two times, holding the key down each time. Notice there is no AUTO-REPEAT.**

3. Press the key a third time and hold it down. The character will begin repeating on the screen.
4. Continue holding down the key until you have as many characters as you want.
5. When you have the number of characters you want, release the key.

The rate of the AFC REPEAT is determined by a special-option setting called REPEAT RATE. Ordinarily, the setting of REPEAT RATE will be adjusted automatically when you set the rate for the method in a given setup. (In this case, 7 is a moderately slow assisted keyboard rate; the repeat rate is also 7.) Setting a slower rate (such as 5) for the method will also slow down the repeat rate. If you ever want to speed up or slow down the repeat rate without changing the assisted keyboard rate, you can do so by changing the special option of REPEAT RATE. (See Chapter 5.)

The same AFC REPEAT function can be used with any characters which are normally auto-repeatable from the Apple keyboard, such as ARROW functions and CONTROL- functions. For example, you might want the cursor to move back over the group of letters you have created. In this case, just press the LEFT-ARROW key three times, holding it down on the third press, as above.

If you are using this as a tutorial, feel free to experiment with REPEATING various characters. Avoid pressing ESC, because that will cause you to exit the test window.

To learn the rules and limitations of the AFC test window, see "'S' or 'T' Setup: Using the Test Window" in Chapter 6. Read until you see a row of stars (***), then return here.

LATCHING SHIFT AND CONTROL

To type a dollar sign or a question mark on a computer keyboard, you normally need to hold down two keys at the same time: SHIFT-4 to type a dollar sign and SHIFT-SLASH to type a question mark. Similarly, to use a CONTROL sequence (programmers use CONTROL-G, for example, to get a bell sound), you need to hold down the CONTROL key and press the other

character at the same time. To boot a disk, you hold down three keys at the same time: CONTROL, OPEN-APPLE, and RESET.

The AFC assisted keyboard method provides software latching to eliminate the need for holding down two or more keys at the same time.

1. To type a character normally obtained by holding the SHIFT key, such as \$:

- (1) Press and release the SHIFT key.** You will hear a brief, high pitched tone.
- (2) Press the associated key,** such as the number 4. The shifted key (the \$) will be printed.

Pressing the SHIFT key only "shifts" the next character. If, for example, you next press the '5' key, you will get a 5, not a %, because pressing the SHIFT key only "shifts" one character.

To repeat a shifted character, press SHIFT, then the character, then SHIFT; then when you press the character for the second time, hold it down. After a brief delay, the shifted character will begin repeating.

You can reduce the number of times you need to use the SHIFT key by making use of the special option of AUTO-CAPS. Turning on AUTO-CAPS means the AFC will automatically capitalize any letter you send after a period, question mark, exclamation point, or RETURN. AUTO-CAPS is available in any setup which includes CAPS LOCK in the overlay. (See Chapter 5.)

2. To type a character normally obtained by holding down the CONTROL KEY (such as CONTROL-G for the bell):

- (1) Press and release the CONTROL key (or switch #2).** You'll hear a brief, low pitched tone.
- (2) Press the associated key.**

You can try this with CONTROL-G (for a bell sound), but you won't hear a bell unless the program you are using responds to CONTROL-G with a bell.

To repeat a CONTROL-character, use the same procedure as described above for SHIFT.

LATCHING COMMAND/OPEN-APPLE and OPTION/SOLID-APPLE

The assisted keyboard method also provides latching for COMMAND/OPEN-APPLE and OPTION/SOLID-APPLE, because most application programs that use the APPLE keys expect you hold them down while pressing another key, such as holding down OPEN-APPLE and pressing 'P' to print in AppleWorks.

Some application programs, however, expect you to use these keys by themselves, rather than in combination with other keys. In this case, we say the function of the APPLE keys is *momentary* rather than *latching*, and the AFC's APPLEKEY parameter needs to be adjusted accordingly. (See Chapter 21.)

Using an Assisted Keyboard Setup with Application Software

You have been practicing the assisted keyboard method with the AFC test window. To practice the assisted keyboard with application software, you could try Text Demo, Lemonade Stand, or Alex the Rabbit on your Sample Application Software disk, or any software of your own choosing.

To use application software with any setup:

1. Select and LOAD the setup.
2. When the SETUP IN EFFECT window appears, remove the AFC Menu Disk and put in your application disk. Then press RETURN.

The application disk will boot, and you can use the assisted keyboard setup to run your application program. (See the preceding tutorial if any help is needed.)

Short Cuts for Advanced Users

Selecting setups from the Extended Menu is useful for a beginner, but a quicker way is to use the Quick-Start Menu which appears immediately when you turn on the computer, provided the AFC is turned ON. If the setup you want is on the Quick-Start Menu, you can select the setup from there — without using the Menu Disk at all.

For more information about quickly loading a setup or quickly changing method and rate, see "Short Cuts for Advanced Users" in Chapter 6.

Having Your Setup Active at Startup

The AFC is shipped from the factory with a setup called "Normal" in the #1 position — this means only the regular Apple keyboard, *not* your assisted keyboard, is active at startup. To have your method active at startup, all you need to do is move your preferred setup to the #1 position on the Menu Disk.

For instructions, see "Having Your Setup Active at Startup" in Chapter 6.

CREATING YOUR OWN SETUPS

So far, you have used the assisted keyboard method with its standard overlay in the S.Assisted or T.Assisted setup. If and when the existing setups do not meet your needs, we recommend that you move beyond the factory-made setups (which are for general use) and create your own setups (for specific use). Your own setup can have a standard, redefined, or customized overlay.

Chapter 7, REFERENCE: ADDING A SETUP, describes the process of planning a setup and gives specific information about the first step — learning the application software.

Please read the first part of Chapter 7 – "Planning the Setup" and "Learn the Application Software" – up to the line of stars (***). When you reach the stars, return here for details about planning and creating an assisted keyboard overlay.

Planning an Assisted Keyboard Setup

Once you are familiar with your application program, such as Alex the Rabbit, you can begin designing your own setup. Several steps are involved. We'll describe each step, using Alex the Rabbit as an example, but the information will help you design or edit any type of assisted keyboard overlay.

Remember that designing and creating an overlay may be done by a person who uses the computer keyboard or by a person who uses any AFC method with a full-access overlay. Thus if you are an independent assisted keyboard user, you can create your own setups and overlays, *provided* you have your full-access assisted keyboard setup in the #1 position on the Extended Menu, above the double-dotted line. (See "Having Your Setup Active at Startup," Chapter 6.)

To plan a setup with your own overlay, you must:

1. **Know the application software** — so you know what keys and key combinations are needed to run the program.

2. **Decide what keys you want to change and how** (such as changing the 'Y' key to be an UP ARROW , or adding RETURN to each number key, or storing the user's name under the ']' key).
3. **Decide if you want access to the standard (Apple) overlay while this setup is active** or if turning the AFC off to regain the standard overlay is sufficient.
4. **Plan levels** (if needed).
5. **Decide if you want the keys you don't change in your overlay to be standard** (as marked) or null (providing no input to the Apple.)
6. **Decide how to handle lost functions** (in a one-level overlay).
7. **Decide the speech feedback** (optional) — what the user will hear when each key is pressed — if you want this to be talking overlay.

Each of these activities is described below.

LEARN THE APPLICATION SOFTWARE

This is described in Chapter 7, "Planning the Setup: Learn the Application Software."

We will be using Alex the Rabbit as our example application. The keys required for Alex the Rabbit are shown in Figure 7-1, Chapter 7.

DECIDE WHAT KEYS TO CHANGE AND HOW

This means deciding the key to be pressed (USER PRESSES) and how you want that key redefined (what character or characters you want the COMPUTER TO RECEIVE when that key is pressed).

Any key on the Apple keyboard (except the CAPS-LOCK key) may be redefined as a **single character** (such as one ARROW) or a **string** of up to 100 characters (such as putting three ARROWS on one key, or redefining a key to be the user's name). Special keys, such as ESC or RETURN or OPEN-

APPLE may be part of the string. *The important factor here is that the application program do what you want it to do when the redefined key is pressed* — the **COMPUTER RECEIVES** for each redefined key must have the character or sequence of characters required by the application program to produce the **RESULT** you desire.

In the AMY'S ALEX setup, outlined in Figure 8-1, four widely spaced keys on the keyboard (Y, B, D, and L) were redefined as the four **ARROW** keys for a person who found it difficult reaching the standard **ARROW** keys with a headwand. Notice that we filled in the **COMPUTER RECEIVES** and the **RESULT** we are expecting in the application program.

Figure 8-1. Worksheet for an Assisted Keyboard Overlay

Name of Program: Alex the Rabbit (by Apple)

Name of Setup: AMY'S ALEX

Type of Overlay: Redefined

Level #: 1 of 1

Key to be Pressed:	Redefined as:	User Hears	
USER PRESSES	COMPUTER RECEIVES	SPEECH FEED- BACK (optional)	RESULT in Application
-----	-----	-----	-----
Y	UP ARROW	"Up"	Alex moves up
B	DOWN ARROW	"Down"	Alex moves down
D	LEFT ARROW	"Left"	Alex moves left
L	RIGHT ARROW	"Right"	Alex moves right

DECIDE IF YOU WANT ACCESS TO THE STANDARD (APPLE) OVERLAY WHILE THIS SETUP IS ACTIVE

With most AFC input methods, the Apple keyboard remains available, with its standard overlay, for full keyboard access. With the assisted keyboard input method, however, changes in the assisted keyboard overlay affect anyone who needs or expects to use the standard Apple keyboard *while that setup is active*. Thus, changes in the assisted keyboard overlay can affect the AFC user or anyone helping the user.

Several ways are available to gain regain the standard Apple overlay, while a non-standard assisted overlay is active:

- If this is a training situation, an *assistant or helper* can just **turn the AFC off** when the standard overlay is needed, then turn it back on when the user is ready to use the setup.

Also, if a helper *simultaneously* holds down the SHIFT, CONTROL, or OPEN-APPLE key with other keys, the normal function of the keys held down will be active — even if the AFC is on and if some of the keys have been redefined in the assisted keyboard overlay. For example, OPEN-APPLE-CONTROL-RESET will always work when the AFC is on.

- In a situation where the AFC *user* needs access to both the standard overlay and a redefined or customized overlay, you can easily have a **multi-level overlay**, where Level 1 is standard and Levels 2-10 are redefined or customized. For example, you could use a **standard overlay** and put redefined keys not in Level 1 but in Level 2.

An example in which Level 1 remains standard and Level 2 is used for redefinitions is discussed in the MORSE CODE chapter. Considerations in planning a multi-level overlay are outlined below.

In our Alex example, we will assume the user does *not* need access to the standard overlay, so we will plan to create a *one-level* overlay.

PLAN LEVELS (if needed)

When you begin to plan an overlay with levels, you may wish to read "Planning Levels" in Chapter 7. These are the basic considerations:

1. How to shift between levels. You can :

- Use CONTROL-A 5 plus NUMBER of the new level plus RETURN, or
- Define some key to be the special AFC.LEVEL character. Use this key plus NUMBER, or
- Define keys to be AFC.LEVEL plus NUMBER. To shift to a new level, simply press the appropriate key.

2. Deciding the LOCK/REVERT status

When you use the AFC.LEVEL character to shift into a new level, the AFC will either "lock" into the new level or will automatically "revert" to Level 1 after you make a selection in the new level. When you plan your overlay, you can decide which option you prefer.

3. Planning the FALL-THROUGH status

In a multi-level overlay, how do you want the AFC to handle the undefined items in Levels 2-10? The AFC can:

- leave the items undefined (keep them null) or
- use the Level 1 definition (the undefined items on higher levels will "fall through" to have the same meaning as in Level 1)

For more information about planning levels, see Chapter 7.

DECIDE IF YOU WANT THE KEYS YOU DON'T CHANGE TO BE STANDARD OR NULL

In most situations, an assisted keyboard user would probably want any keys not redefined to remain standard (as marked). **To have the undefined keys act as standard keys**, you can choose to create a **redefined** overlay. A redefined overlay starts you out with all keys standard, but you can

immediately make changes. Any keys you don't change are automatically standard.

In some training situations, however, you may want the keys *not* redefined to be null, that is, to provide no input to the Apple. **To have the undefined keys act as null keys**, you can choose to create a **customized** overlay. This starts you out with all keys null: only those keys which you redefine will be active; all remaining keys will be null.

If you are planning a **multi-level overlay**, how undefined keys in Level 1 will act depends upon the type of overlay you selected, as described above. How the undefined keys in Levels 2-10 will act depends on how you set the FALL-THROUGH status. (See "Plan Levels," above, or "Planning Levels" in Chapter 7.)

In our one-level Alex example, we will plan to create a *one-level redefined* overlay. All keys not redefined will remain standard (defined as marked on the Apple keyboard).

DECIDE HOW TO HANDLE LOST FUNCTIONS (in a one-level overlay)

When you create a redefined or customized one-level overlay, you want to be careful that you don't "lose" functions in the overlay that are essential to the user's operation of the application program or the computer.

Considerations in a redefined overlay

With a redefined assisted keyboard overlay, all keys are standard until you redefine them. *If you redefine a key, the original character for that key is no longer available your overlay.* You must think ahead to determine if that particular key is important in your use of the program or the computer.

For example, if we redefine the 'Y' key as UP ARROW, we no longer have a 'Y.' In the case of Alex the Rabbit, this is not important, since we don't need a 'Y.' In some programs, however, 'Y' might be needed to answer questions in the program.

If the original character, such as 'Y,' is needed to run the application program, you can create a two-level overlay, as described earlier, or you can stay with one level and:

- choose another character to redefine, instead of 'Y', or
- redefine another key as the lost function (for example, redefine the 'zero' key to be 'Y')

In our Alex example, we are not concerned about lost functions, so we can stay with the plan of creating a *one-level redefined* overlay.

Considerations in a customized overlay

When you create a customized assisted keyboard overlay, all keys are null until you redefine them. This means *all functions are lost until you put them back in*. For example, if you do not redefine keys to be ESC, ARROWS, RETURN, the user will not have these functions available while the setup is in effect and the AFC is ON. To regain these functions from the keyboard, a helper has to turn the AFC OFF or simultaneously hold down the SHIFT, CONTROL, or OPEN-APPLE key with the needed key.

If you *simultaneously* hold down SHIFT, CONTROL, or OPEN-APPLE with other keys, the normal function of the keys you hold down will be active. This allows a helper to escape the AFC test window (SHIFT-T) or reboot a disk (CONTROL-APPLE-RESET) even if the AFC is on and those keys are null or redefined in the assisted keyboard overlay.

Be sure to redefine important keys (such as ESC, ARROWS, RETURN) if you want these available *to the AFC user* while the setup is active.

DECIDE THE SPEECH FEEDBACK (optional)

If you have a speech synthesizer (as described in Chapter 3), you may want to create your redefined overlay as a talking overlay. If you do not create it as a talking overlay, you will not have the option for speech feedback.

In some applications, you might want the SPEECH FEEDBACK to be the same as what the COMPUTER RECEIVES, such as the name of a letter. In other applications, however, this would not make sense. Notice in Figure 8-1 that

we want the new UP-ARROW key to say "up," not "up arrow." We could also try having it say "jump up, Alex."

Creating the Setup on Disk

Before creating a setup on disk, it's helpful to have a quick overview of the process:

Extended Menu → Construction Programs → Extended Menu
(ADD A SETUP) (CREATE, SAVE, QUIT) (LOAD and use setup)

First you select ADD A SETUP from the bottom of the Extended Menu. This takes you to the setup Constructions Programs — you select a method and create an overlay. When done, you SAVE the setup on disk, then QUIT. Selecting QUIT takes you back to the Extended Menu, where you can LOAD the setup in the usual way and use it with an application.

Each screen and each step is described in detail in Chapter 7. The only variations relating to the assisted keyboard are:

- The screen will use the word "key," rather than "item," eg. "Press key user presses," rather than "Indicate item user selects."

SUMMARY WITH "AMY'S ALEX" EXAMPLE

Quick steps for creating a setup are given below. Instructions for the Amy's Alex example are in small italics — you'll need to have your worksheet (Figure 8-1) available to work from. For more detailed instructions, without the Amy's Alex example, use "Creating the Setup on Disk" in Chapter 7. (The step numbers below and in Chapter 7 are the same.)

Getting Started

1. Boot the Menu Disk. Press '9' (or use SPACEBAR or ARROWS) to select **ADD A NEW SETUP** from the bottom of the Extended Menu.
2. From the list of input methods, select **ASSISTED APPLE KEYBOARD**.
3. Enter a **TITLE**.

4. Select the TYPE OF OVERLAY: customized, standard, or redefined standard.

For Amy's Alex, select REDEFINED STANDARD.

5. Select your SPEECH-FEEDBACK choice.
6. When the CREATE OVERLAY MAIN MENU appears, you can begin defining keys in any level of the overlay.
 - To work with in Level 1, select WORK WITH OVERLAY.
 - To work with another level, select USE LEVELS, then select CHANGE LEVELS.
 - When you have finished the overlay, you will select TEST/SAVE/QUIT.

For Amy's Alex, select WORK WITH OVERLAY.

7. A prompt to turn on your AFC may appear.

Basic Steps

You are now ready to begin defining keys. The basic steps for each key will be (don't do this yet):

- (1) Press key user presses.
 - (2) Enter characters computer receives.
 - (3) Enter speech feedback user hears (if you opted for speech feedback).
 - (4) When you have programmed a good part of the overlay, select TEST/SAVE/QUIT and SAVE your work to disk.
8. When the screen says **PRESS KEY USER PRESSES**, press the first key you want to redefine. You can define keys in any order.

For Amy's Alex, press the first key listed on the worksheet — the 'Y' key.

9. The screen changes to show the key you pressed. **To ENTER CHARACTERS COMPUTER RECEIVES**, press the keys for the character or characters you want the computer to receive when this key is pressed.

CAUTION: In most cases, you can just press the keys for the characters you want to enter in **COMPUTER RECEIVES**. Special considerations, however, are: upper versus lower case and "special" characters such as **LEFT ARROW**, **RIGHT ARROW**, **ESC**, or **RETURN**. To enter "special" characters, press **ESC** when the screen shows "Enter characters computer receives," then select the character you want from the special-character window. For help or a listing of special characters, see Chapter 7, step 9.

For Amy's Alex, UP and DOWN ARROWS are not "special" characters. For the new UP-ARROW and DOWN-ARROW keys, just touch the UP-ARROW or DOWN-ARROW key on the Apple keyboard, then press RETURN.

*When ready to enter **COMPUTER RECEIVES** for the new **LEFT-ARROW** and **RIGHT-ARROW** keys, press **ESC** for the special-character window.*

10. If you selected a speech synthesizer, the screen will show **ENTER SPEECH FEEDBACK USER HEARS**. For details, see Chapter 7, step 10.

For Amy's UP-ARROW key, enter the word "up" – then press RETURN.

11. When the screen changes, you can press **SPACEBAR** to hear the speech again. Your choices are at the bottom of the screen. If everything is as you want it, just press return to **PROCEED TO NEXT KEY**.
12. Repeat steps 8-11 to **PROGRAM EACH KEY** you want to redefine.

*For Amy's Alex, use the worksheet (Figure 8-1) to help you program the four keys. Do UP ARROW and DOWN ARROW first: those are not "special" characters. When ready for LEFT ARROW and RIGHT ARROW, press ESC for the special-character window. (For help with **COMPUTER RECEIVES**, see "Special Characters" in step 9, Chapter 7.)*

The following information is available in Chapter 7:

- | | |
|---------------------------------------|------------------------|
| 9. Enter characters computer receives | 17. Test it! |
| 10. Enter speech feedback user hears | 18. Change method/rate |
| 13. Changing or deleting entries | 19. Continue creating |
| 14. Listing contents | 20. Quitting |
| 15. Free memory | 21. Multiple levels |
| 16. Saving your work | |

Note: In working with multiple levels, setting the LOCK/REVERT status and the FALL-THROUGH status will be important in the successful use of your overlay. These are described in detail in Chapter 7.

Multiple levels are not needed in the Amy's Alex example.

Test/Save/Quit

To use the new setup, you must first SAVE it on disk. In fact, it is a good idea to save your work fairly often (such as every 10 minutes), even if you are not done. To save the setup you are working on, **follow the prompts on the screen to return to the Create Overlay Main Menu. From the Create Overlay Main Menu, select TEST/SAVE/QUIT, then select SAVE TO DISK.**

You can also select TEST IT! from the Test/Save/Quit choices, to test your setup in a Test Run window.

To exit the Test Run window, press ESC. If the ESC key is not active in your assisted keyboard overlay, you can simultaneously hold down the SHIFT and ESC keys, or you can turn off the AFC and press ESC.

To use the setup with your application software, you must first return to the Extended Menu. The safest way to do this is to select QUIT from the Test/Save/Quit choices. The screen will then offer the choices: **CREATE ANOTHER SETUP** or **EXIT TO EXTENDED MENU**.

If, while using the Create Overlay program, you added an AFC.MACRO character to the overlay, the screen will also offer the choice **WORK WITH MACROS**. (See Chapter 17 for details about macros and the Macro Manager program.)

If you are ready to use your setup with application software, select **EXIT TO EXTENDED MENU**.

Using or Changing the Setup

When you return to the Extended Menu, the new setup will be at the end of the menu. Your options include:

- Completing the Description window for this setup: press RETURN to bring up the Choices window, then select MAKE CHANGES ... DESCRIPTION.
- Trying out the setup with your application program: press RETURN to bring up the Choices window, then select LOAD THIS SETUP.
- Making changes in method, rate, overlay, or special options: press RETURN to bring up the Choices window, then select MAKE CHANGES ... then select the part of the setup you want to change.
- Moving the setup to any location on the Extended Menu, including the fixed Quick-Start Menu: highlight the setup, press CONTROL-R, then use ARROWS to move the setup.

See Chapter 6 for help with any of these options.

CHAPTER 10

THE EXPANDED KEYBOARD

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CHAPTER 10

THE EXPANDED KEYBOARD

This chapter will provide detailed information regarding the expanded keyboard method, including understanding the basic method, using the standard overlays, and creating your own setups and overlays. We assume you have read the Introduction and Chapters 1-2 in this manual and have made use of the hands-on demos in those chapters. A quick view of the expanded keyboard method is available in Chapter 3.

WHAT IS AN "EXPANDED" KEYBOARD?

The expanded keyboard method was designed for the person who can touch the keys or squares on a **larger or smaller keyboard** which connects to the AFC I/O box. We use *expanded keyboard* to mean **any AFC-input keyboard**, regardless of its size. We use *square* to mean **the individual key or unit** on an expanded keyboard, regardless of whether that unit is round or square. When you touch a square on the expanded keyboard, the AFC sends a character, word, or phrase to the Apple.

A variety of AFC-input keyboards are available. Each is actually a matrix of switches which can be connected to the AFC 36 pin connector. Examples include:

- the **Unicorn** Expanded Keyboard by Unicorn Engineering
- the **King** and **Mini** Keyboards by TASH
- the **Narwhal** Board by EKEG Electronics
- the **Florida** Expanded Keyboard by Exceptional Computing

A special cable is needed to connect each keyboard to the 36 pin connector on the AFC I/O box. (This cable is supplied by the keyboard manufacturer — see Appendix C.)

In general, these keyboards interact with the AFC in the same way — the ability to program single squares, to run commercial software, to have speech feedback, and so forth are available through the AFC.

Different keyboards, of course, differ in how they look and feel to the user. Such properties as the size, spacing, and sensitivity of the keys are particular to each keyboard and can be very important in the effectiveness of that keyboard for a particular user. (See the chapter titled FACTORS AND RESOURCES.) A brief description of each keyboard follows:

Unicorn Expanded Keyboard	128 touch-sensitive 1.25" membrane keypads. A paper overlay with symbols (letters, words, drawings, or photographs) is placed over the squares and beneath the protective plastic sheet. A "standard overlay" resembling the Apple keyboard is provided. When you design your own overlays, you can group the small squares together to create larger squares or blocks.
---------------------------	--

King Keyboard	64 separated and enlarged 1.25" microswitch keys. These are slightly recessed to let you rest or stabilize a limb on the keyboard without activating keys. Large keyboard characters are printed on the keys.
---------------	---

Mini Keyboard	a small keyboard with 64 closely spaced, small membrane keypads. These can be activated by touching with any blunt pencil-like object. The small size of the keyboard (7.5" x 4.5") means that only a small range of movement is needed to access the entire keyboard.
---------------	--

Narwhal Board	128 touch-sensitive one-inch squares. A clear plastic cover can be peeled back and a paper overlay placed over the keyboard. When you design your own overlays, you can group the small squares together to create larger squares or blocks.
---------------	--

Florida Expanded Keyboard

128 light-touch .7" x 1.5" keys. Comes with one standard overlay plus blank overlays. When you design your own overlays, you can group the small squares together to create larger squares or blocks.

This chapter will use the Unicorn, King, and Mini Keyboards as examples, since these are the prevalent keyboards at this time, but most information applying to the Unicorn Keyboard applies to the Narwhal and Florida boards as well.

Method and Rate

The METHOD in an expanded keyboard setup is simply this: you touch a square to send a character, word, or phrase to the computer.

The RATE in your AFC setup corresponds to an acceptance time — it affects how quickly the keyboard responds to your touch.

The range of rates is 1-29. A very slow rate (1-5) is helpful if you must slide a hand across the keyboard in order to reach a desired square. A fast rate (20-29) means a square will respond almost immediately when touched.

Overlays

Each of the expanded keyboards described above is fully customizable —that is, using tools on the AFC Menu and Construction Disk, you may define the squares on your expanded keyboard to be anything you want. **How the squares are defined is called the OVERLAY.**

The STANDARD overlay for your expanded keyboard is a general-purpose arrangement of all the characters and functions available on the standard Apple keyboard. The standard overlays were intended for general use in situations where access to all keyboard characters is important — virtually all commercial software will work with a standard overlay. You simply use the standard overlay in place of the Apple keyboard. Standard overlays are shown in Figures 10-1 and 10-2.

The STANDARD UNICORN overlay (Figure 10-1) is so called because it was originally designed for the Unicorn Expanded Keyboard, but it applies to the Narwhal and Florida boards as well. The arrangement of characters is very similar to the arrangement of keys on the Apple IIe computer keyboard.

The TASH King and Mini Keyboards both use the STANDARD KING/MINI overlay (Figure 10-2).

REDEFINED overlays are modifications of the standard overlay for your keyboard. For example, you may wish to change the location of specific keys, or add additional levels of characters.

CUSTOMIZED overlays are created from scratch — they most likely do not resemble the standard overlay at all. They can be very complex or very simple, using only the characters or character combinations required to operate a particular application program. (Often this is a small subset of the entire alphabet. For examples on your Extended Menu, see Chapter 3.)

Figure 10-1. The Standard Unicorn Overlay

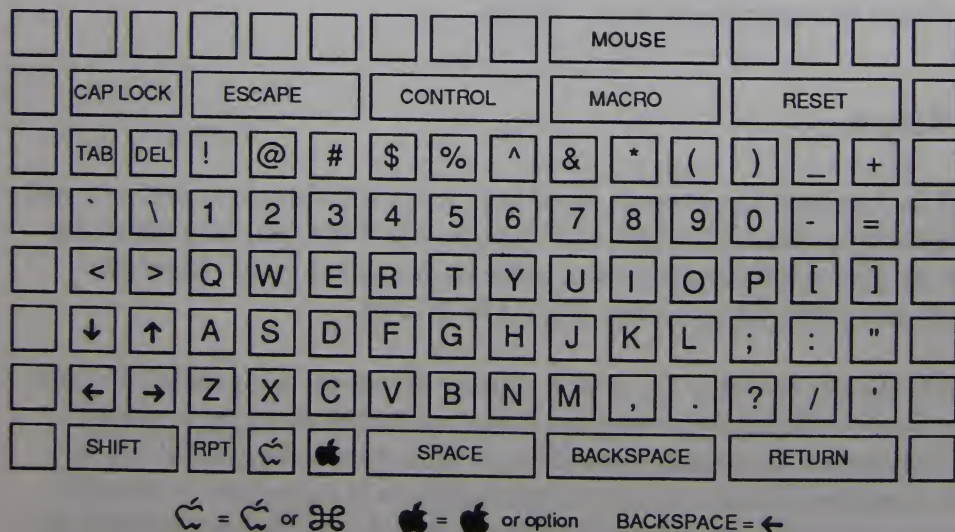
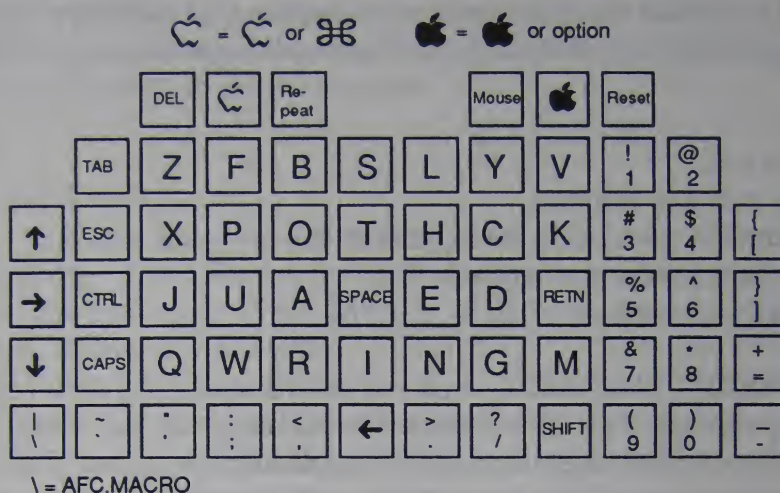


Figure 10-2. The Standard King/Mini Overlay



STORED OVERLAY VERSUS PAPER OVERLAY

With an expanded keyboard, it is useful to distinguish two components of the overlay — the *paper* overlay and the *stored* overlay.

PAPER OVERLAY means the printed or paper overlay which you *see* when using an expanded keyboard.

STORED OVERLAY means the data *stored on disk* which tells the AFC what the computer should receive when you press particular squares.

As an example, the standard overlays shown in Figures 10-1 and 10-2 really have two parts: the *paper overlay*, supplied by the manufacturer of the expanded keyboard, and the *stored overlay*, provided on the AFC Menu Disk. In order for the *paper overlay* to be functional, you must select the setup with the appropriate *stored overlay* from the AFC Menu Disk and load it onto the Adaptive Firmware Card. A tutorial for using your expanded keyboard with its standard overlay is available later in this chapter.

Speech Feedback Options

WITH APPLICATION SOFTWARE

An expanded keyboard that **talks and runs application software** can be useful in many situations, particularly for users who experience any of the following:

- cannot read
- have visual impairments
- have trouble associating the input from the keyboard with the effect in the software program
- are auditory learners

With AFC SPEECH FEEDBACK, when you press a square, the AFC has your speech synthesizer "speak" a character, word, or phrase then sends certain characters to the computer to run the application program. This speech feedback option allows **the addition of speech feedback to the expanded keyboard overlay** but does *not* add speech to the application program.

For information about using the speech feedback option, see "Using AFC Speech Feedback," Chapter 3.

FOR COMMUNICATION ONLY

The TALKING WORD BOARD program (TWB) is a special application program for people with limited speech abilities. It allows you to turn the AFC, a speech synthesizer, and an expanded keyboard into a **talking communication board**.

When you touch a square, the speech synthesizer speaks the message (letter, word, or phrase) defined for that square. The TWB can also say each message and remember a string of messages that can then be said together. The message appears on the screen and can be printed on the printer.

To use the TWB, you design your own paper overlays, then use the TWB disk to create the stored vocabulary files. Examples range from complex multi-level overlays with letters, words, and phrases for multi-purpose

communication to very simple overlays with large pictures for specific activities, such as a game of Simon Says.

If you plan to use the TWB, we recommend reading and using the tutorials in this chapter to become familiar with your expanded keyboard. Then, for specific information regarding the Talking Word Board, boot the TWB program and select 'O' for Instructions.

DISTINCTIONS

The Talking Word Board is NOT designed to work with other application software. The TWB is a dedicated application designed to work by itself.

- If you want an expanded keyboard that talks *and* runs an application program, use the AFC Menu and Construction Disk to create an expanded keyboard overlay *with speech feedback*. (See "Creating Your Own Setups," this chapter.)
- If you want an expanded keyboard dedicated to *communication only*, use the Talking Word Board program to create and save a TWB vocabulary file. (TWB files are not the same as setups; they cannot be saved on the Menu Disk or the Startup Menu.)

Layout Options for the Unicorn Keyboard

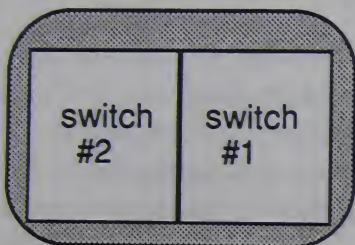
You may see or hear customized overlays for the Unicorn Keyboard described as using a certain LAYOUT OPTION, identified by number or by a description, such as "2x2 squares, all squares active." The phrase "2x2", "3x3", etc., means that this stored overlay makes use of the AFC's ability to group a set of individual squares on the Unicorn Keyboard into functional blocks. Touching any of the squares in that block sends the same character or characters to the computer. ("2x2" means each block is two squares wide and two squares deep.)

The phrase "all squares active" means any square can send characters to the computer, provided it is programmed to do so. The phrase "isolated" means the active squares are isolated from each other by *inactive* squares, that is, squares which cannot send characters to the computer.

The AFC provides seven ready-to-use layout options, shown in Figure 10-3, but you can also create your own. (See Layout Option #8 in Figure 10-3.)

The Unicorn as Two Switches

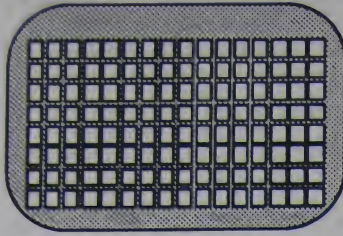
If you are using switch-input software, rather than keyboard-input software, you can use the Unicorn as two switches, rather than as a keyboard-emulating device. In this case, all you need to do is load the setup titled **NORMAL** or the setup titled **SW INPUT**. With either of these setups active, the left half of the Unicorn = switch #2 and the right half = switch #1.



The Unicorn when the SW INPUT setup is in effect or when the AFC input method = normal, scanning, or Morse code.

For examples of switch-input software, see the chapter titled **ONE SWITCH, TWO SWITCH, RED SWITCH, BLUE SWITCH**.

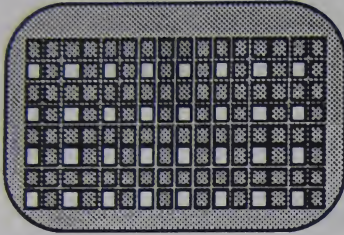
Figure 10-3. Layout Options for the Unicorn Keyboard



Layout Option #1

128 small squares
all squares active

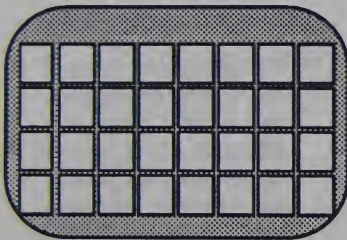
For a complete computer keyboard or for a user who can accurately touch small squares, even in a limited range. You can arrange items in any order and place the most-frequently-used items in the easiest-to-reach squares.



Layout Option #2

32 small squares
isolated by inactive
squares

Good for a user who can touch small squares but who finds it easier to work with the squares spaced farther apart than in Layout Option #1.

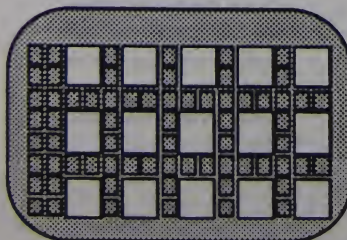


Layout Option #3

32 blocks*
of 2x2 squares
all squares active

Requires less refined control than #2, because the squares are larger. Symbols can be 2" square - ideal for visually impaired or younger users.

32 squares or blocks (Options #2 or 3) can work well with applications requiring the full alphabet plus up to 6 additional keys such as SPACE, RETURN, and ARROWS.



Layout Option #4

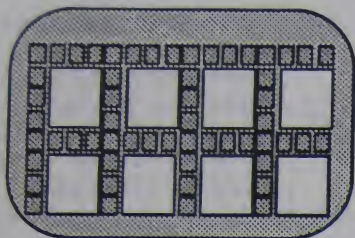
15 blocks*
of 2x2 squares
isolated by inactive
squares

Good for programs that require 15 or fewer responses, such as pre-school or early childhood programs requiring the numbers 1-9 and up to 6 additional keys.

□ = Active square or block of squares.
Each will produce a tone when pressed
and can send characters to the computer.

■ = Inactive squares. These will not produce a
tone when pressed. They cannot send any
characters to the computer.

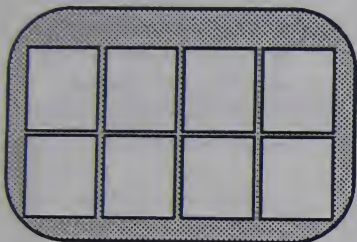
Figure 10-3 (continued). Layout Options for the Unicorn Keyboard



Layout Option #5

8 blocks*
of 3x3 squares
isolated by inactive
squares

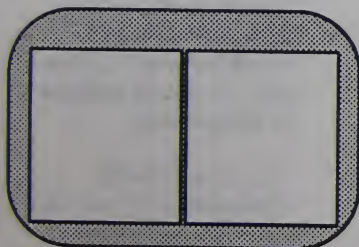
While 8 blocks is not a large number, remember that strings of characters can be defined for each block, such as "ERNIE" or "THE GIRL" or whatever is appropriate for the application program.



Layout Option #6

8 blocks*
of 4x4 squares
all squares active

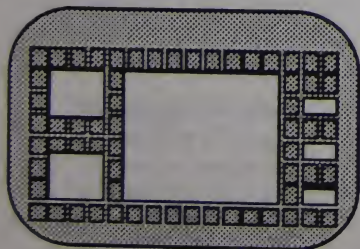
Larger blocks than in #5, because all squares are active.



Layout Option #7

2-half Unicorn*
all squares active

For applications where only 2 items are required, such as SPACEBAR and RETURN. Ideal for users who require large pictures or symbols or who have very limited motor control.



Layout Option #8

CREATE
YOUR OWN
LAYOUT*

For situations where the predefined layout options do not meet your needs, you can create your own arrangement of active and inactive squares with blocks of any shape and size.

* When squares on the Unicorn Model I are grouped into blocks, use of a "dead-spot eliminator" is recommended. (See Chapter titled FACTORS AND RESOURCES.)

USING YOUR EXPANDED KEYBOARD AND ITS STANDARD OVERLAY

In this section, you will use your expanded keyboard with its standard overlay, that is, the printed or paper overlay showing all the individual characters on the Apple keyboard. Even if you do not plan to use the standard overlay, we recommend using this section to become familiar with your keyboard and the specifics of using it with the AFC.

Getting Started

To use this section as a hands-on tutorial, you will need:

- An Adaptive Firmware Card, already installed
- Your copy of the AFC Menu Disk
- Your expanded keyboard connected by a cable to the 36 pin connector on the I/O box.

***** CAUTION:** *Make sure the computer is OFF when connecting or disconnecting this cable. ****

- With most expanded keyboards, you will also need the paper overlay called "Standard Overlay for Apple IIe" (this came with your expanded keyboard).

Using Your Keyboard

Some steps apply only to particular keyboards. These are marked "UNICORN" or "KING and MINI". "Unicorn" includes any keyboard with the standard overlay shown in Figure 10-1.

The plan will be:

- (1) Select the "S" (standard) or "T" (talking standard) setup for your keyboard from the Extended Menu.

Unicorn: use the S.UNICORN or T.UNICORN setup.

King and Mini: use the S.KINGMINI or T.KINGMINI setup.

- (2) Use the Make Changes window to set the rate to 20.
- (3) Load the revised setup and bring up the test window.

To do this, you can use the quick steps below or, for more detailed instructions, leave a marker here and go to "Using an 'S' or 'T' Setup" in Chapter 6. Read that section until you see a row of stars (***), then return here.

Quick Steps:

1. Boot the AFC Menu Disk.
 2. Move the cursor to the "S" (or "T") setup for your expanded keyboard; press RETURN.
 3. Press RETURN again to get the Choices window on the screen.
 4. Select MAKE CHANGES IN SETUP.
 5. Select METHOD/RATE.
 6. Respond Y to the caution window, then change the rate to 20.
 7. When the Choices window reappears, select LOAD THIS SETUP.
 8. When the SETUP IN EFFECT window appears, press T to Test the setup.
-

When the test window appears, you are ready to begin exploring your keyboard!

1. **Touch a few letter squares on the expanded keyboard.** The letters you touch will appear in the test window.

Notice that the expanded keyboard responds almost immediately to a fairly light touch. The time it takes for the keyboard to respond is determined by the AFC rate (acceptance time) — you're using a rate of 20, which is a fast rate. You will experiment with different rate settings later in this tutorial.

Notice also that the computer makes a "beep" as feedback when a square on your keyboard has been touched for the required acceptance time. This is your signal that you can go on to another square.

If you ever want to eliminate this "beep," you can do this by means of the special option called **CLICK FEEDBACK**. (See Chapter 5.)

2. **Press a few letters on the Apple keyboard.** These letters will also appear in the test window, showing you that the Apple keyboard is still operational.

Special Functions

REPEAT

The AFC expanded keyboard does not have an **AUTO-REPEAT**: when you press a square on the expanded keyboard, that character will not repeat unless you lift your hand and touch the square again. This helps avoid accidental repeats.

Instead of an **AUTO-REPEAT**, the **AFC expanded keyboard method** provides a special **REPEAT** character, which can be used to repeat the previous character or function as many times as desired, with ease.

- Unicorn: the **REPEAT** character is in the left half of the bottom row, marked **RPT**.
- King and Mini: the **REPEAT** character is the square above "B."

To repeat a character:

1. **Touch the square for the character you want to repeat**, such as 'X'. The character will appear in the test window.
2. **Touch and stay on the REPEAT square**. The character you last touched will begin repeating on the screen and will continue repeating for as long as you hold down the REPEAT square.

You can press the REPEAT square again for that same character to continue repeating.

3. **When you have the number of characters you want, simply press the square for the next character you want to use**. You'll hear a quick low tone, indicating REPEAT mode has ended.

The rate of the AFC REPEAT is determined by a special-option setting called REPEAT RATE. Ordinarily, the setting of REPEAT RATE will be adjusted automatically when you set the rate for the method in a given setup. (In this case, 20 is a fast acceptance rate and the repeat rate will a moderately fast rate of 10.) Setting a slower rate (such as 5) for the method will also slow down the repeat rate. If you ever want to speed up or slow down the repeat rate without changing the expanded keyboard acceptance time, you can do so by changing the special option of REPEAT RATE. (See Chapter 5.)

The REPEAT function can be used to repeat special functions, as well as letters and punctuation. For example, you might want the cursor to move back over the group of letters you just created. To repeat a special function:

- (1) **Touch the square for the function you want repeated**, such as the LEFT-ARROW square.
- (2) **Touch and stay on the REPEAT square** until the function has repeated as many times as you want.
- (3) **When done, simply press the square for the next character or function you want to use**.

If you need help with the test window, see "'S' or 'T' Setups: Using the Test Window" in Chapter 6. Read until you see a row of stars (***), then return here.
--

CAPS LOCK VERSUS SHIFT

1. The AFC CAPS-LOCK character on your standard overlay is marked CAPS or CAPS LOCK. When you first load a setup which has CAPS LOCK in the overlay, the AFC CAPS LOCK is OFF, so you get lower-case letters.

You will not get lower-case letters if you are using application software which does not print in lower case. In fact, you might even get strange results — the same results as if you were typing lower-case letters from the Apple keyboard.

To get all upper-case letters (such as "THE"), touch the CAPS-LOCK square. You will hear a low tone, indicating selection of the CAPS-LOCK function. Since CAPS LOCK was previously OFF (you were sending lower-case letters), you have just turned it ON: all letters you select from the expanded keyboard will now be sent as upper case.

The AFC CAPS-LOCK character is like the CAPS-LOCK key on the computer keyboard: **it toggles you between all-upper-case and all-lower-case.**

2. **To return to all lower-case letters (such as "the"), toggle the CAPS-LOCK function back off by touching the CAPS-LOCK square again.**
3. Your standard overlay also has a square marked SHIFT. **When the CAPS-LOCK function is off, you can get upper-case for one letter only (such as "The"), by first touching the square marked SHIFT.** You will hear a high tone, indicating the SHIFT function has been activated.

NOTE: If an overlay does not contain a square for CAPS LOCK, all letters sent from the expanded keyboard will be automatically sent as upper case.

If an overlay includes CAPS LOCK, the special option of AUTO-CAPS becomes available. Turning on AUTO-CAPS means the AFC will automatically capitalize any letter you select after a period, question mark, exclamation point, or RETURN. (See Chapter 5.)

CONTROL-KEY OR APPLE-KEY SEQUENCES

When you use the Apple keyboard, you are often required to hold down two or more keys at the same time, such as the CONTROL key plus another character or the COMMAND/OPEN-APPLE KEY or OPTION/SOLID-APPLE key plus another one or more characters. With the AFC expanded keyboard method, you simply touch the required squares in sequence: you do not have to hold down two squares at the same time.

For more information about CONTROL sequences and APPLE keys, see "'S' or 'T' Setup: Special Characters and Functions" in Chapter 6.

SHIFTED CHARACTERS

UNICORN KEYBOARD:

To get a punctuation character, all you have to do is **touch the square for that character**. (With the Apple keyboard, you'd have to hold down the SHIFT key and press the associated number key at the same time.)

The {, }, |, and ~ characters may not be marked on your paper overlay, but you can get these characters. They are located above the same characters as on the Apple keyboard. (You might want to take your overlay off the keyboard and mark these.)

To get { touch SHIFT, then [.

To get | touch SHIFT, then \ .

To get } touch SHIFT, then] .

To get ~ touch SHIFT, then ` .

KING and MINI KEYBOARDS:

Some squares on your keyboard (the number squares and the bottom row of squares) have two characters per square. This is the same "doubling up" of characters as on the Apple keyboard.

Look at the square (bottom row) that has '/' with a '?' above.

To get the lower of two characters (the '/ '), touch the square. It won't matter whether you are in upper-case or lower-case mode — you will get the lower character.

To get the upper of two characters (the '?'), touch the SHIFT square, then touch the character square. The upper character (the '?') will appear on the screen.

Experimenting with Rate

Some people think that they need to press harder if the expanded keyboard is not responding quickly enough. Actually, they probably need to increase the rate setting so that the AFC responds more quickly when the expanded keyboard is touched.

With the expanded keyboard method, the RATE setting is an acceptance time — it **determines how quickly the keyboard responds to your touch**. The rate can be set from 1 to 29. A very slow rate (1-5) is helpful for a user who must slide a hand across the keyboard in order to reach a desired square. A fast rate (20-29) means a square will respond almost immediately when touched. (If you are reading this as a tutorial, you have been using a rate of 20, which is a fast rate.)

A rate setting that is too fast or too slow can be very frustrating, so time should be spent to determine the ideal rate for each user.

If the rate is too slow, you will feel like the keyboard is not responding and will try pressing harder. *Pressing harder does not speed up the keyboard's response*. Instead, you should try setting the rate to a higher number (a faster rate).

If the rate is too fast, you will get many accidental responses. This is especially true if you must slide your hand, headstick, etc. across the keyboard in order to reach certain squares. In this case, you should try setting the rate to a lower number (a slower rate).

1. **Slide your hand across the expanded keyboard and see what happens.** If the current rate is 20, you will probably find that the keyboard responds quickly — so quickly that you may be getting letters in the test window that you don't want.

2. **Change the rate to 5.** From the test window, the steps are:

- (1) Press ESC two times to bring up the Choices window.
- (2) Select MAKE CHANGES IN SETUP ... METHOD/RATE and change the rate to 5.
- (3) When the Choices window reappears, select LOAD THIS SETUP and press T to test the setup.

3. **Try sliding your hand across the expanded keyboard.**

You will notice that, at a rate of 5, the keyboard is not responding as quickly — you can slide your hand across the keyboard without getting as many "accidental responses." *When your finger is on the square you want, you don't need to press hard — you just need to pause lightly on that square until the keyboard responds.*

4. **Use the Make Changes window again, and slow down the rate from 5 to 1. Load the revised setup and press T to test.**

Try using the expanded keyboard. The keyboard will be very slow to respond. Your natural tendency will be to press harder. *Do not press harder. Hold your finger gently on the square that you want. In time, the keyboard will respond.*

Try dragging your hand slowly and heavily across the keyboard to spell your name. You will be able to spell your name without error if your long pauses are only on correct letters.

A slow setting, such as 1, is a good rate for some users. If, however, you find yourself trying to press down hard, you'll know what it feels like if the rate is slower than it should be for you! *It is important that the rate setting be tailored to the individual user.*

5. **Feel free to use Make Changes ... Method/Rate to experiment with different rate settings. Be sure to set the rate back to a comfortable setting when you are done. Real-time equivalents of the expanded keyboard rates are shown on the next page.**

Real-time equivalents of the expanded keyboard rates are:

RATE	ACCEPTANCE TIME
------	-----------------

0	3 seconds
2	2 seconds
3	1.5 seconds
5	1 second
10	immediate response
20	more immediate response
25 }	seemingly instantaneous
29 }	

6. If you are reading this as a tutorial, you are done: try touching the CONTROL square, then the OPEN-APPLE square, then the RESET square. This disk in the drive will reboot, even though you did not hold down three squares at the same time.

Using an Expanded Keyboard Setup with Application Software

You have been practicing the expanded keyboard method with the AFC test window. To practice the expanded keyboard method with application software, you could try using the standard overlay with Text Demo, Lemonade Stand, or Alex the Rabbit on your Sample Application Software disk.

To use application software with any setup:

1. Select and LOAD the setup.
2. When the SETUP IN EFFECT window appears, remove the AFC Menu Disk and put in your application disk. Then press RETURN.

The application disk will boot, and you can use the expanded keyboard setup to run your application program. (See the preceding tutorial if any help is needed.)

Short Cuts for Advanced Users

Selecting setups from the Extended Menu is useful for a beginner, but a quicker way is to use the Quick-Start Menu which appears immediately when you turn on the computer, provided the AFC is turned ON. If the setup you want is on the Quick-Start Menu, you can select the setup from there — without using the Menu Disk at all.

For more information about quickly loading a setup or quickly changing the AFC rate, see "Short Cuts for Advanced Users" in Chapter 6.

Having Your Setup Active at Startup

The AFC is shipped from the factory with a setup called "Normal" in the #1 position — this means only the Apple keyboard, *not* your expanded keyboard, is active at startup. To have your method active at startup, all you need to do is move your preferred setup to the #1 position on the Menu Disk, above the double dotted line.

For instructions, see "Having Your Setup Active at Startup" in Chapter 6.

CREATING YOUR OWN SETUPS

In the preceding section, you used your expanded keyboard with the standard overlay in your "S" or "T" setup. If and when the existing setups do not meet your needs, we recommend that you move beyond the factory-made setups (which are for general use) and create your own setups (for specific use). Your own setup can have a standard, redefined, or customized overlay.

Chapter 7, REFERENCE: ADDING A SETUP, describes the process of planning a setup and gives specific information about the first step — learning the application software.

Please read the first part of Chapter 7 – "Planning the Setup" and "Learn the Application Software" – up to the line of stars (***). When you reach the stars, return here for details about planning and creating an expanded keyboard overlay.

Designing an Expanded Keyboard Overlay

Once you are familiar with your application program, such as Alex the Rabbit, you can begin designing an overlay for your expanded keyboard. Several steps are involved. We'll describe each step, using Alex the Rabbit as an example, but the information will help you design or edit any type of expanded keyboard overlay.

Remember that designing and creating an overlay may be done by a person who uses the computer keyboard or by a person who uses any AFC method with a full-access overlay. Thus if you are an independent expanded keyboard user, you can create your own setups and overlays, *provided* you have your full-access expanded keyboard setup in the #1 position on the Extended Menu, above the double-dotted line. (See "Having Your Setup Active at Startup," Chapter 6.)

The steps are:

- choose the items you want to include in this overlay
- select or design the layout option
- decide which squares to use
- plan for each square: the symbol, the characters the computer will receive, and (optional) the speech feedback
- plan levels (if needed)

DECIDING THE ITEMS TO INCLUDE

You must first decide what characters or character combinations you want in the overlay. This will be based on the requirements of the application software, the goals of the computer activity, and what you know about the abilities of the user with the expanded keyboard. Each item may be a single character, such as one letter, or a string of up to 100 characters. The characters you choose could be the entire list you wrote down when reviewing the software or a subset of that list, since you may not be planning to use all the characters required in the application software.

For example, you might be creating an overlay for Alex the Rabbit for a person who can easily touch four squares of a given size, but not five. If the goal of the activity is to improve concepts of up, down, left, right, you would not want to make the motor task, touching squares, too difficult. So you would probably choose to limit your overlay to four items: the four ARROW keys.

If, on the other hand, this user can easily touch five different squares, you might choose to use five items on your overlay: the four ARROW characters plus one other. You might choose RETURN as the fifth item, since this allows the user to start the game. During the game, RETURN makes Alex wiggle his ears.

In our example, let's assume the chosen items are:

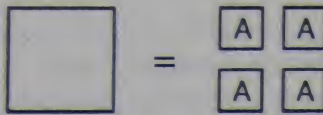
UP ARROW	LEFT ARROW	RETURN
DOWN ARROW	RIGHT ARROW	

SELECTING THE LAYOUT OPTION

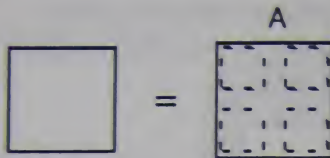
With the Unicorn keyboard, a customized overlay may have anywhere from two very large squares (each one is half of the keyboard) to 128 small squares, each sending a different character or characters to the computer. The Adaptive Firmware Card has seven different *layout options*, which are designed to help you isolate or group squares on the Unicorn as needed. (See Figure 10-3, earlier in this chapter.)

When you want two or more adjoining squares to send the same characters to the computer, you could program each square individually, but it is a better

to use a layout option which groups those squares together as a functional unit. This saves time when programming the overlay on disk and avoids the problem of multiple triggering when the overlay is in use.



If four squares are *individually programmed*, and the user accidentally touches two of the smaller squares at the same time — or touches between two squares when a dead-spot eliminator is in place — the computer could get two messages, in this case, two A's instead of one A.



If four squares are a functional unit in an AFC *layout option*, and if the user performs as described above, the computer will only get a single message, the message for the block, in this case, A.

In selecting a layout option, keep in mind the visual and motor abilities of the user (see the chapter titled **FACTORS AND RESOURCES**) and the number of items you want in the overlay. (You can store items on more than one level — this will be discussed later in this chapter.)

You are not limited to the layout options in Figure 10-3. If none of these meets your needs, you can create your own arrangement of active or inactive squares with blocks of any size or shape. Instead of selecting a pre-defined layout option, you would select "Create Your Own Layout" from the list of layout options.

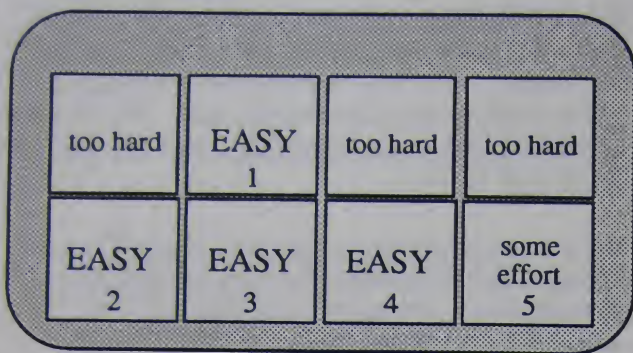
For our Alex the Rabbit example, let's say that, after reviewing the needs of the user, you selected Layout Option #6. This has squares grouped in 4x4 blocks, and all squares are active.

DECIDING WHICH SQUARES TO USE

You will want to put the items which will be used the most frequently on the squares which the user can reach the most easily. We suggest making a rough drawing of your expanded keyboard.

On your drawing, mark which squares the user can most easily reach, which ones can be reached with some effort, and which, if any, are too hard to be used at all. Remember, no matter how many squares are available, you don't need to use them all. After doing this, we suggest you number the squares

you plan to use — this is not necessary, but it may be a useful way to refer to them later.



In our example, we'll assume that the easy and hard squares are as shown here, and that you've numbered the squares you plan to use.

DRAFTING THE LAYOUT

Now that you know what items you want on the overlay and which squares you want to use, you can begin to plan the actual layout. You will need to decide, for each square:

- (1) **SYMBOL:** what symbol will be used on the paper overlay
- (2) **COMPUTER RECEIVES:** what character or characters the AFC will send to the computer when that square is pressed
- (3) **SPEECH FEEDBACK:** what the user will hear when that square is pressed (if this will be a talking overlay)

This can be written down on your keyboard drawing, or on an expanded keyboard overlay worksheet. Figure 10-4 shows a worksheet for our example of Alex the Rabbit.

The main idea of an overlay worksheet is that you plan each item in your overlay prior to creating the stored overlay on disk. The components of the worksheet in Figure 10-4 are: a drawing of the expanded keyboard showing how the paper overlay will look, vertical columns which let you define each square in the overlay, and identifying information which will make the worksheet useful as your record of what is in the overlay.

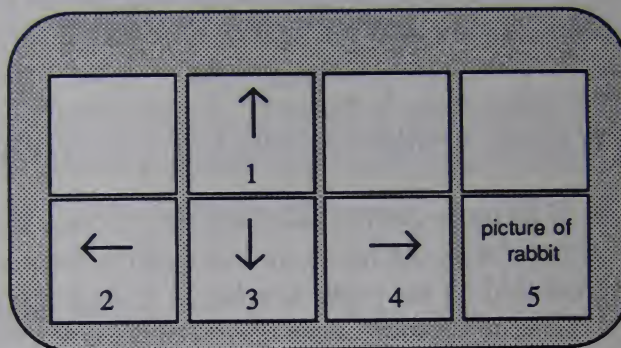
Figure 10-4. Worksheet for a Customized Unicorn Overlay for Alex the Rabbit

Name of Program: Alex the Rabbit (by Apple)

Name of Setup: MY ALEX

Layout Option #: 6

Level #: 1 of 1



Item # (your ref only)	SYMBOL on paper overlay	COMPUTER RECEIVES	SPEECH FEEDBACK (optional)	RESULT in Application
1	↑	UP ARROW	"Go up, Alex"	Alex moves up
2	←	LEFT ARROW	"Go left, Alex"	Alex moves left
3	↓	DOWN ARROW	"Go down, Alex"	Alex moves down
4	→	RIGHT ARROW	"Go right, Alex"	Alex moves right
5	Rabbit	RETURN	"Go"	Starts game or wiggles ears

Item Numbers (optional)

ITEM NUMBERS are simply your personal reference for each square you will be using in the overlay. This is not required.

Symbols

The SYMBOLS you show (on your eventual paper overlay) can be letters, words, Picsyms, Blissymbols, drawings, stickers, screen dumps of program graphics, or whatever will denote the appropriate selection to the user. What you show on the paper overlay does not have to be identical to what the COMPUTER RECEIVES when that square is pressed — it just needs to be related in a way that makes sense to the user. The abilities of the user and the goals of the activity should strongly influence your symbol selection.

For example, if an early childhood counting program requires the user to respond with the numbers 1 through 3, the numbers could be represented on the paper overlay in several ways: with numerals (1, 2, 3); with words (one, two, three); with pictured quantities (one jelly bean, two jelly beans, three jelly beans); or, if the child knows sign language, with pictures of the hand signs for these numbers. Several different paper overlays with different symbols could be used with the same stored overlay, as long as, in this case, the symbol to represent each number is always located on the correct square. Thus, a child learning to read numerals could use the program first with jelly bean or hand-sign numbers, then with the numerals.

In our Alex example, let's plan to use four arrows to represent the four directions and a picture of a rabbit to represent starting the program or wiggling his ears during the game.

Location of Items

Look at the squares you decided to use and the list of items you want in the overlay. You need to decide which items will go where and to draw in the symbols on your worksheet. Consider such factors as:

- Will some items be used more frequently than others? Are some squares easier to reach than others? If so, try putting the more frequently needed items in the easier-to-reach squares.

In our example, RETURN is only needed once — to start the program — so let's put that in a harder-to-reach square.

- Will some symbols make more sense or be easier to find in certain locations?

In our example, it makes sense to arrange the arrows in appropriate directions in the easier-to-reach squares. (See drawing in Figure 10-4.)

When you've decided on the location for each item, list the item numbers and what the user will see (the paper-overlay symbols) in the first two columns of your worksheet, as shown in Figure 10-4.

Computer Receives

Once you've listed the items by location and by symbol, you're ready to fill in the COMPUTER RECEIVES column on your worksheet. Using the original list of keyboard characters you wanted to include in the overlay, fill in the COMPUTER RECEIVES column with the exact character or characters you want the AFC to send to the computer when that square is pressed.

CAUTION: *The important factor here is that the application program do what you want it to do when that square is pressed — the COMPUTER RECEIVES for each item must be the character or sequence of characters required by the application program to produce the RESULT you desire.* Each item number in Figure 10-4 shows the SYMBOL and the COMPUTER RECEIVES for that square plus the RESULT we are expecting in the application program.

In our Alex example, each "arrow" square sends the appropriate ARROW, and the "rabbit" square sends RETURN. In some applications, however, a square marked "→" may really send a SPACEBAR or OPEN-APPLE RIGHT-ARROW — whatever the program requires to produce the "→" action.

Also in our example, each square on the overlay only sends **one character** to the computer, because that is all we need in this application. Remember, however, that one square in the overlay could send **a string** of up to 100 characters as well.

Speech Feedback (optional)

If you are creating a talking overlay, you should also consider, for each square, what you want the speech synthesizer to say when that square is pressed, and write this down on the worksheet. You don't need to worry, at this point, how the speech will sound. Once you are creating the overlay on disk, you will be able to hear what the speech sounds like.

The SPEECH FEEDBACK column in Figure 10-4 shows a plan for what the user hears for each square in our example overlay.

In some applications, what the user hears could be the same as what the COMPUTER RECEIVES, such as the name of a letter. In other applications, such as Alex the Rabbit, this would not make sense. Notice in Figure 10-4 that we want the UP-ARROW square to say "Go up, Alex" rather than "up arrow."

Designing Levels

In some applications, you may have reason to design an expanded keyboard overlay which has more than one LEVEL. A typewriter keyboard, for example, may be thought of as having two levels: you use the SHIFT key to shift between levels.

With the AFC expanded keyboard method, **your expanded keyboard may have as many as ten levels in one overlay**. You shift between levels by means of level-shift commands (from the Apple keyboard or from the expanded keyboard). As with the typewriter keyboard, the characters the computer receives when a square is pressed depends on the level you are using at that time.

If this is an overlay for the Unicorn Keyboard, the layout option you select (grouping of squares into blocks) applies to all levels.

In our Alex example, we only need one level. Feel free to skip ahead to "Creating the Setup on Disk," so that you can create and use the overlay we have designed so far. Then, at a later time, read the reference below about designing an overlay that has more than one level.

For a discussion of levels, please read "Planning Levels" in Chapter 6. Read until you see the line of stars (***), then return here.

Creating the Setup on Disk

Before creating a setup on disk, it's helpful to have a quick overview of the process:

Extended Menu → Construction Programs → Extended Menu
(ADD A SETUP) (CREATE, SAVE, QUIT) (LOAD and use setup)

First you select ADD A SETUP from the bottom of the Extended Menu. This takes you to the setup Constructions Programs — you select a method and create an overlay. When done, you SAVE the setup on disk, then QUIT. Selecting QUIT takes you back to the Extended Menu, where you can LOAD the setup in the usual way and use it with an application.

Each screen and each step is described in detail in Chapter 7. The only variations relating to the expanded keyboard method are:

- The screen will use the word "square," rather than "item," eg. "Touch square user touches," rather than "Indicate item user selects."
- To "touch square," you can:
 - touch the square on your expanded keyboard or
 - enter the AFC's code name for that square, as described in the tutorial below (step 8)

SUMMARY WITH "MY ALEX" EXAMPLE

Quick steps for creating a setup are given below. Instructions for the Alex the Rabbit example are in small italics — you'll need to have your worksheet

(Figure 10-4) available to work from. For more detailed instructions, without the Alex example, use "Creating the Setup on Disk" in Chapter 7. (The step numbers below and in Chapter 7 are the same. A step marked "b" here is unique to the expanded keyboard method.)

Getting Started

1. Boot the Menu Disk. Press '9' (or use ARROWS or SPACEBAR) to select ADD A NEW SETUP from the bottom of the Extended Menu.
2. From the list of input methods, select EXPANDED KEYBOARD.
3. Enter a TITLE.

For the Alex tutorial, enter the title from the worksheet, "My Alex."

- 3b. From the menu of INPUT DEVICES, select your device. "Unicorn Keyboard" includes any keyboard with the standard overlay shown in Figure 10-1.

For Alex, select UNICORN KEYBOARD.

4. Select the TYPE OF OVERLAY: customized, standard, or redefined standard.

For Alex, select CUSTOMIZED.

5. Select your SPEECH-FEEDBACK choice.

- 5b. If the Unicorn is your input device, a list of LAYOUT OPTIONS, as described in Figure 10-3, will appear. To see what a layout looks like, move the cursor to the layout and press D for Description. To select a layout, move the cursor to the layout and press RETURN.

Once you have selected a layout, you cannot change your choice. The option to CREATE YOUR OWN LAYOUT is the last choice on the list.

For the Alex tutorial, select Layout Option #6.

6. When the CREATE OVERLAY MAIN MENU appears, you can begin defining squares in any level of the overlay.

- To work with Level 1, select WORK WITH OVERLAY.
- To work with another level, select USE LEVELS, then select CHANGE LEVELS.
- When you have finished the overlay, you will select TEST/SAVE/QUIT.

To begin the Alex overlay, select WORK WITH OVERLAY.

7. A prompt to turn on your AFC may appear.

Basic Steps

You are now ready to begin defining squares. The basic steps for each square will be (don't do do this yet):

- (1) Touch square user touches.
 - (2) Enter characters computer receives.
 - (3) Enter speech feedback user hears (if you opted for speech feedback).
 - (4) When you have programmed a good part of the overlay, select TEST/SAVE/QUIT and SAVE your work to disk.
8. To TOUCH SQUARE USER TOUCHES, just touch the first square on your expanded keyboard that you want to define.

In the Alex tutorial, touch the square you will be using for UP ARROW.

If your expanded keyboard is not available:

- Unicorn: You can create a setup without having a Unicorn or an AFC connected to the computer. When the screen says "Touch square user touches," just enter the square's code name from the Apple keyboard, then press RETURN.

Single squares are coded for columns A-P and rows 1-8, as shown on the Standard Unicorn paper overlay. If the layout

option has combined small squares into blocks, each block is given the code-name of the upper-right square in that block.

For the Alex example, with Layout Option #6, the 8 squares are coded

D1 H1 L1 P1

D5 H5 L5 P5

You will be programming 5 of these squares: H1, D5, H5, L5, P5.

- King and Mini: Code-names for squares on the King and Mini Keyboards are not as readily available, so the best way to create a setup is to use a computer with an AFC and your keyboard installed.
-

9. The screen changes to show the AFC's code-name for the square you touched.

For Alex, this will be "H1".

To ENTER CHARACTERS COMPUTER RECEIVES, press the keys for the character or characters you want the computer to receive when this square is pressed.

CAUTION: In most cases, you can just press the keys for the characters you want to enter in COMPUTER RECEIVES. Special considerations, however, are: upper versus lower case and "special" characters such as LEFT ARROW, RIGHT ARROW, ESC, or RETURN. *To enter "special" characters, press ESC when the screen shows "Enter characters computer receives," then select the character you want from the special-character window. For help or a listing of special characters, see Chapter 7, step 9.*

For Alex, UP and DOWN ARROWS are not "special" characters. For the UP-ARROW and DOWN-ARROW squares, just touch the UP-ARROW or DOWN-ARROW key on the Apple keyboard, then press RETURN.

When ready for COMPUTER RECEIVES with LEFT ARROW, RIGHT ARROW, and RETURN, press ESC for the special-character window.

10. If you selected a speech synthesizer, the screen will show **ENTER SPEECH FEEDBACK USER HEARS**. For help, see Chapter 7, step 10.

11. When the screen changes, you can press SPACEBAR to hear the speech again. Your choices are at the bottom of the screen. If everything is as you want it, just press RETURN to PROCEED TO NEXT SQUARE. For help with changing or deleting entries, see Chapter 7, step 13.
12. Repeat steps 8-11 to PROGRAM EACH SQUARE you want to define. The following information is available in Chapter 7:
 9. Enter characters computer receives
 10. Enter speech feedback user hears
 13. Changing or deleting entries
 14. Listing contents
 15. Free memory
 16. Saving your work
 17. Test it!
 18. Change method/rate
 19. Continue creating
 20. Quitting
 21. Multiple levels

Test/Save/Quit

To use the new setup, you must first SAVE it on disk. In fact, it is a good idea to save your work fairly often (such as every 10 minutes), even if you are not done. To save the setup you are working on, **follow the prompts on the screen to return to the Create Overlay Main Menu.** From the Create Overlay Main Menu, select **TEST/SAVE/QUIT**, then select **SAVE TO DISK**.

You can also select TEST IT! from the Test/Save/Quit choices, to test your setup in a Test Run window.

To use the setup with your application software, you must first return to the Extended Menu. The safest way to do this is to select QUIT from the Test/Save/Quit choices. The screen will then offer the choices: **CREATE ANOTHER SETUP** or **EXIT TO EXTENDED MENU**.

If, while using the Create Overlay program, you added an AFC.MACRO character to the overlay, the screen will also offer the choice **WORK WITH MACROS**. (See Chapter 17 for details about macros and the Macro Manager program.)

If you are ready to use your setup with application software, select **EXIT TO EXTENDED MENU**.

Using or Changing the Setup

When you return to the Extended Menu, the new setup will be at the end of the menu. Your options include:

- Completing the Description window for this setup: press RETURN to bring up the Choices window, then select MAKE CHANGES ... DESCRIPTION.
- Trying out the setup with your application program: press RETURN to bring up the Choices window, then select LOAD THIS SETUP.
- Making changes in method, rate, overlay, or special options: press RETURN to bring up the Choices window, then select MAKE CHANGES ... then select the part of the setup you want to change.
- Moving the setup to any location on the Extended Menu, including the fixed Quick-Start Menu: highlight the setup, press CONTROL-R, then use ARROWS to move the setup.

See Chapter 6 for help with any of these options.

Completing the Paper Overlay

Once the new setup is complete, you are ready to create the "final" paper overlay for your expanded keyboard. Blank paper overlays may be supplied with the expanded keyboard, or they can be created from sheets of paper. The following tips may be helpful in your final design.

- Use symbols, pictures, stickers, textured materials, etc., as symbols for users who cannot read. If you have a way to screen dump a picture from the monitor, you can use the same picture that is used in the program.
- Using heavier paper will reduce the sensitivity of a membrane keyboard. Lighter paper will increase it — this could be an advantage for very weak users.
- Make sure that the squares on your paper overlay will line up exactly with the squares on the expanded keyboard. If they do not, a user may respond correctly on the paper overlay, but register an incorrect or undesired response from the computer.

- **Work first with a soft pencil. If you need to erase, remove the overlay from the expanded keyboard,** because filings can become statically charged and stick to your keyboard.
- **Draw your symbols as clear and as dark as possible.** Colored symbols are more interesting to many users. You can color-code your squares by making different sets of squares different background colors.
- **Cautions with colors:** If you are using more than one color in a square, make sure that the color of one won't make the other color run. If you are using colored markers, be sure to remove the overlay from the expanded keyboard before you start coloring, or the markers may bleed through to the keyboard. Avoid using watercolor or other media that would make the paper buckle.
- **UNICORN Model I (yellow):** If you are using blocks which consist of several squares, **be aware of the small "dead space" between the squares.** This is not a problem for most users, but if it is, you may want to mark the active parts of the block for the user to aim for. If the dead space becomes a problem, a dead-spot eliminator can be purchased or made. (See the chapter titled **FACTORS AND RESOURCES.**) The Unicorn Model II (blue) does not have dead spaces.

EXPANDED KEYBOARD OVERLAY WORKSHEET

Name of Application Program: _____

Name of Setup: _____

Layout option #: _____

This overlay consists of how many levels? (1-10) _____

Level # _____

Item # (your ref only)	Symbol (on paper overlay)	COMPUTER RECEIVES	SPEECH FEEDBACK	RESULT in Application (optional)
-----	-----	-----	-----	-----

If this overlay has more than one level, how do you want the AFC to handle undefined items in Levels 2-10?

Use the Level 1 definition

Leave the items undefined

If AFC.LEVEL characters are in the stored overlay, what should happen after a level shift has been made from the expanded keyboard:

LOCK into new level

REVERT to level 1

CHAPTER 11

MORSE CODE

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CHAPTER 11

MORSE CODE

This chapter will provide detailed information regarding the Morse code methods, including using the different methods, using the standard codes, and creating your own setups and overlays. We assume you have read the Introduction and Chapters 1-2 and have used the hands-on demos in those chapters. A quick view of the Morse code methods is available in Chapter 3.

The AFC Morse code methods have two quite distinct applications:

- (1) **Full keyboard access:** The **standard Morse code** overlay provides a highly effective means of generating all keyboard characters and command codes by means of one or two switches. It can be a particularly efficient method for people who use two switches or a dual-action sip-and-puff switch.

Morse code, in this form, is relatively more demanding than scanning as an input method, due to the switch-control and code-learning requirements. But it can also be considerably faster than scanning for two-switch users. Headswitch users have been known to reach keyer rates of 11 words/minute; sip-and-puff users have been known to reach keyer rates of 30 words/minute.

- (2) **Special limited access:** Morse code may also be used to adapt some programs very satisfactorily for use with one or two switches. For example, a program which requires just SPACEBAR and RETURN could be used with a **redefined or customized Morse code** overlay, such that pressing switch #1 sends SPACEBAR and pressing switch #2 sends RETURN.

In this form, Morse code can provide one of the simplest and least demanding ways of accessing the computer. It can be ideal for **motor-training** and **switch-control-evaluation** applications.

This chapter has been written primarily with application #1 (full keyboard access) in mind. If you are interested in application #2, we suggest you read this chapter, up to "Creating Your Own Setups," to understand the different Morse code methods, then see the chapter titled ONE SWITCH, TWO SWITCH, RED SWITCH, BLUE SWITCH.

WHAT IS MORSE CODE?

Morse code was originally developed in 1853 by Samuel Morse as a system for transmitting messages via overland telegraph lines, by telegraph operators using a single switch (straight key). It continues to be used today in such applications as ham radio communication, by ham radio operators using the traditional straight key or the more popular two-switch keyer.

In its most basic terms, Morse code is a highly efficient system for generating text by means of just one or two switches, and as such it has received wide recognition as a special-input method. In fact, one could say that Morse invented the first *alternate keyboard*, for people who could use one or two switches!

The basic building blocks of the code are sounds of short or long duration. These are usually shown on paper as dots and dashes (see Figure 11-3) but are called *dits* and *dahs*. (The *dit* is the short signal, the *dah* is the long signal.)

In International Morse Code, each letter of the alphabet, each number, and each punctuation mark is composed of a different combination of *dits* and *dahs*. Part of the efficiency of the system is that letters which are used the most frequently, such as E and T, have the shortest codes. (See Figure 11-3.)

Morse Code on the AFC

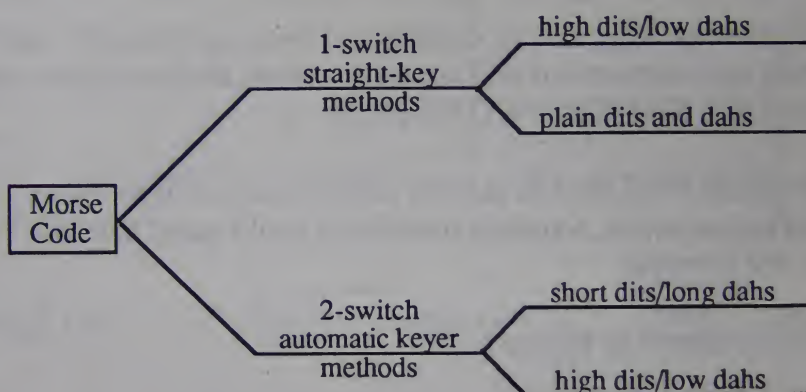
In the Adaptive Firmware Card, Morse code is an input method whereby the user presses one or two switches to send sequences of *DIT* and *DAH* signals. The AFC translates these signals into computer keyboard characters and sends them to the computer, just as if they had been typed on the keyboard.

The code definitions (how sequences are translated into characters) are user definable, which means that the AFC's "Morse code" may not necessarily be the same as the Morse code used by ham radio operators.

With the AFC, if you can use two switches, you would choose a 2-switch automatic-keyer Morse code method. If you can use only one switch, you would choose a 1-switch straight-key method.

Within each of these methods, you have a choice of two variations, depending on what you prefer the *dit* and *dah* signals to sound like when you press the switches. These basic choices are shown in Figure 11-1.

Figure 11-1. Choice of Methods and Variations



For any Morse code method, timing plays a crucial role. Sending Morse code is a dynamic process which is governed by a RATE for code sending. Beginning code senders use a relatively slow rate at first, to build accuracy, then gradually increase their speed, with practice. The rate must allow you to be accurate. First accuracy, then speed.

Once you have selected a method and rate, you have a choice of code sets, which we call "OVERLAYS."

The STANDARD Morse code overlay is an expansion of International Morse code and contains codes for all keys on the Apple keyboard. The codes include International Morse Code for letters, numbers, and punctuation, plus additional codes for all of the additional characters and special keys on the Apple keyboard, including SPACE, RESET, REPEAT, ESCAPE, CONTROL, SHIFT, CAPS LOCK, ARROWS, COMMAND/OPEN-APPLE, and OPTION/SOLID-APPLE. These are shown in Figures 11-3 and 11-4.

REDEFINED overlays are standard overlays with codes which have been altered for a particular user or application. A code may send one character to the computer or may send a string up to 100 characters long.

CUSTOMIZED overlays may also be created, but these are primarily used for motor training applications and will not be discussed in this chapter. (See the chapter titled ONE SWITCH, TWO SWITCH ...).

OPTIONAL SPEECH FEEDBACK may be added to any of these overlay types. With this option active, a speech synthesizer could speak the name of each character, for example.

Overlay choices are shown in Figure 11-2.

Figure 11-2. Choice of Morse Code Overlays

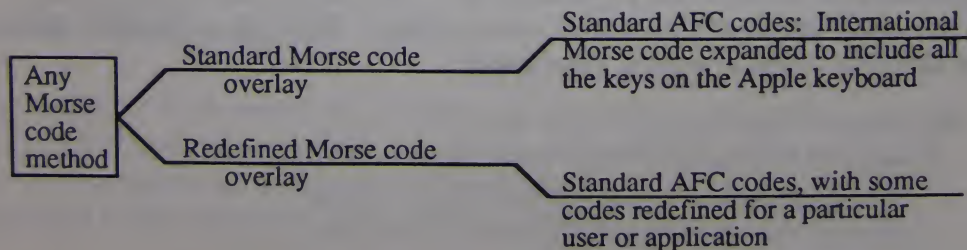









Figure 11-3. AFC Standard Morse Code: Letters, Numbers, and Function Keys

A · —	J · — — —	R · — ·	1 · — — — —
B — · · ·	K — · —	S · · ·	2 · · — — —
C — · · ·	L · · · ·	T —	3 · · · — —
D — · ·	M — —	U · · —	4 · · · · —
E ·	N — ·	V · · · —	5 · · · · ·
F · · — ·	O — — —	W · — —	6 — · · · ·
G — — ·	P · — — ·	X — · · —	7 — — · · ·
H · · · ·	Q — — — —	Y — · — —	8 — — — · ·
I · ·		Z — — — ·	9 — — — — ·
esc (OE) — — — ·			0 — — — — —
delete (U) · · — · ·	control (KS) — · — · · ·	reset (UK) · · — — — ·	
tab (NX) — · — · · —	macro (SO) · · · — — —	return · — · — —	
shift (HN) · · · · — ·	mouse/ joystick (MJ) — — · — — —	repeat (HM) · · · · — —	
caps lock (DM) — · · — —	 — — — —	 (UU) · · — · · —	
level (AL) · — · — · ·	 (MU) — — — · ·	 (MW) — — · — —	
option  (SD) · · · · ·	  (DD) — · · · · ·	spacebar · · — — —	

[.]	·-·-·-·-	[']	·-·-·-·-	[@]	·-·-·-·-	[(]	·-·-·-·-
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[,]	-·-·-·-·-	["]	·-·-·-·-	[#]	-·-·-·-·-	[)]	·-·-·-·-
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[:]	-·-·-·-·-	[-]	-·-·-·-·-	[\$]	·-·-·-·-	[<]	-·-·-·-·-
-----	-----------	-----	-----------	------	----------	-----	-----------

[;]	-·-·-·-·-	[_]	-·-·-·-·-	[%]	-·-·-·-·-	[>]	-·-·-·-·-
-----	-----------	-----	-----------	-----	-----------	-----	-----------

[!]	·-·-·-·-	[/]	-·-·-·-·-	[`]	-·-·-·-·-	[[]	·-·-·-·-
-----	----------	-----	-----------	-----	-----------	-------	----------

[?]	·-·-·-·-	[\]	-·-·-·-·-	[^]	·-·-·-·-	[]	·-·-·-·-
-----	----------	-------	-----------	-----	----------	-----	----------

[+]	·-·-·-·-	[]	SHIFT ·-·-·-·- then / -·-·-·-·-	[&]	-·-·-·-·-	[{]	SHIFT ·-·-·-·- then [·-·-·-·-
-----	----------	-------	------------------------------------	-----	-----------	-------	-----------------------------------

[=]	-·-·-·-·-	[~]	SHIFT ·-·-·-·- then ` -·-·-·-·-	[*]	·-·-·-·-	[}]	SHIFT ·-·-·-·- then] ·-·-·-·-
-----	-----------	-------	------------------------------------	-----	----------	-------	-----------------------------------

Many codes in the AFC standard Morse code overlay were taken from the codes used in the Alternative Communication System Project, University of Washington (McDonald, et al, 1981) and from the extended Morse code described by Friedlander and Rahimi (1979).

Morse Code Methods

While it is possible to send Morse code in any of a variety of ways, the AFC methods are based on two methods familiar to ham radio operators: the AUTOMATIC KEYER and the STRAIGHT KEY. To understand these methods, it is helpful to know how a ham radio operator sends Morse code.

For a "ham," Morse code is simply a tone that goes on and off, so timing is critical. The distinction between *dit* and *dah* is one of length. A *dah* is three times as long as a *dit*; the time between *dits* and *dahs* is the length of one *dit*; the end of a character is denoted by a pause equal to three *dits* in length; and a SPACE is denoted by a pause equal to six *dits* in length.

Fortunately, using Morse code with the AFC is considerably simpler. With the AFC, sending Morse code amounts to sending a sequence of *dits* and *dahs* and then pausing for the AFC to know you have completed that character. The pause for SPACE has been eliminated, so you don't have to worry about pausing too long. In addition, other timing requirements have been relaxed to make sending code much easier than it sounds!

2-SWITCH AUTOMATIC KEYER

You must use two switches. When you hold switch #1 (or the OPEN-APPLE key) closed, you will hear a string of *dits*. When you hold switch #2 (or the OPTION/SOLID-APPLE key) closed, you will hear a string of *dahs*. This means you only need to make one movement (to close and hold the switch) to send several *dits* or *dahs* in a row. This is the method most frequently used by ham radio operators today.

For the AFC user, the correct timing of individual *dits* and *dahs* is not essential, since the AFC can distinguish between *dit* and *dah* based on which switch is being pressed. However, the regularity of tones produced by the automatic keyer provides helpful feedback in learning to send code efficiently with a certain rhythm.

Two variations of the 2-switch automatic keyer are available. These differ in what you hear when you press switch #2 for the *dah* signals.

In 2-switch HIGH/LOW, the *dahs* are the same length as *dits* but are a lower-pitched tone. This sounds different from traditional Morse code but may be easier to learn.

In 2-switch SHORT/LONG, the *dahs* are the same pitch as *dits* but three times as long. This *sounds like* traditional Morse code.

In the 2-switch automatic-keyer methods, the **rate** you set determines how rapidly the *dits* and *dahs* are repeated while the switch is closed and how long you must pause to register the end of a character.

1-SWITCH STRAIGHT KEY

Only one switch is needed, which we will call switch #1. **When you hold switch #1 closed, you will hear a constant tone. If you hold the switch closed for a short time, the AFC will consider the tone a *dit*. If you hold it closed for a longer time, the AFC will consider the tone a *dah*.** To send a character, you must make a separate movement for each *dit* and each *dah*, then pause to denote the end of the character. Otherwise, the timing is not very critical. *Dahs* do not need to be three times as long as *dits*, nor is the spacing between *dits* and *dahs* critical, as long as you do not pause so long between signals that the AFC thinks you are done with that character.

Two variations are available. These differ in what you hear when you hold the switch closed long enough to send a *dah*.

In 1-switch HIGH/LOW, when you hold the switch closed long enough to be a *dah*, the pitch of the tone changes. This sounds different from traditional Morse code but may be easier to learn.

In 1-switch PLAIN, when you hold the switch closed long enough to be a *dah*, the pitch of the tone does not change. This *sounds like* traditional Morse code.

In the 1-switch straight-key methods, the **rate** you set determines how short a signal must be to be a *dit* (or how long it must be to be a *dah*) and how long you must pause to register the end of the character.

COMPARISON OF 1-SWITCH AND 2-SWITCH METHODS

A major difference between the 1-switch and 2-switch methods is that the 2-switch automatic keyer will send a string of *dits* or *dahs* of correct duration, once you press the appropriate switch. The 1-switch straight key, on the other hand, only produces a constant tone, so you must correctly time the short (*dit*) and long (*dah*) signals.

Advantages of the 2-switch automatic-keyer method are:

- no requirement to correctly time the *dit* and *dah* signals
- relative flexibility in the time allowed between releasing one switch and pressing the other
- the reduced number of movements required to produce a letter.

The AFC automatic keyer also makes use of an option known as "self-completion." This enables the keyer (the AFC) to remember one signal ahead of itself. For example, if the AFC is still sending a *dah* when you press and release the *dit* switch, the AFC will remember to send the *dit* when it has finished sending the *dah*.

The advantage of the 1-switch straight-key method is

- only one switch is required.

The disadvantage is

- more precise motor skill is required than with the automatic keyer method, because more movements and more exact timing are required.

The best way to understand both methods is to try them. (See the tutorial in the "Using" section of this chapter.)

Figure 11-5 summarizes the steps involved in sending *dit* and *dah* signals and sequences with the automatic-keyer and straight-key methods.

Figure 11-5. Summary of Automatic-Keyer versus Straight-Key Morse Code Methods

	<u>2-Switch Automatic Keyer</u>	<u>1-Switch Straight Key</u>
To send one <i>dit</i>	press switch #1 listen for one <i>dit</i> release the switch before you hear a second <i>dit</i>	press switch #1 hear the <i>dit</i> tone release the switch before the tone is long enough to be a <i>dah</i>
To send one <i>dah</i>	press switch #2 listen for one <i>dah</i> release the switch before you hear a second <i>dah</i>	press switch #1 hear the <i>dit</i> tone hold the switch closed long enough to be a <i>dah</i> release the switch
To send <i>dit-dit-dit</i>	press switch #1 listen for three <i>dits</i> release the switch before you hear a fourth <i>dit</i>	press switch #1 hear the <i>dit</i> tone release the switch before the tone is long enough to be a <i>dah</i> quickly press the switch again to send another <i>dit</i> do this a total of three times to send three <i>dits</i>
To send <i>dah-dah-dah</i>	same as sending three <i>dits</i> , except you use switch #2	same as sending three <i>dahs</i> , except that for each <i>dah</i> you must hold the switch closed long enough to be a <i>dah</i>
To send <i>dit-dah-dah</i>	press switch #1 listen for one <i>dit</i> release switch #1 anytime after the <i>dit</i> begins (and before a you hear a second <i>dit</i>) quickly press switch #2 listen for two <i>dahs</i> release switch #2 anytime after the second <i>dah</i> begins (and before you hear a third <i>dah</i>)	press switch #1 hear the <i>dit</i> tone release the switch before the tone is long enough to be a <i>dah</i> quickly press the switch again hear the <i>dit</i> tone hold the switch closed long enough to be a <i>dah</i> release the switch quickly press the switch again hold the switch closed long enough to be a <i>dah</i> release the switch

A Note on "Learning" the Codes

If you are a novice, the task of "learning Morse code" may sound difficult — perhaps because we show two pages of codes to learn (Figures 11-3 and 11-4) or because "learning Morse code" has traditionally meant learning to understand it, as well as to send it. Learning to use Morse code to operate a computer, however, is not necessarily as difficult as it sounds, for two reasons.

First, you only need to learn to *send* the codes — you don't have to translate them, because the AFC does that.

Second, you do not need to immediately learn *all* the codes or to send them quickly. Learning to be a good code sender is very similar to learning to be a good touch typist — first practice a few letters until you are accurate, then gradually learn another group of letters, then another. Continue through all the letters, numbers, and important codes, such as SPACE, RETURN, PERIOD, QUESTION MARK. Practice these by copying words and short sentences. After you are accurate, concentrate on increasing your speed. Teach yourself the additional codes as you need them.

The tutorial in the next section will be helpful in getting the "feel" of Morse code. References are provided at the end of the chapter.

A detailed case study of an adult learning to send Morse code with a sip-and-puff switch is available in Beukelman, Yorkston, and Dowden (1985). Some of their training strategies would apply even if a different type of switch were used. For example, they describe a system of visual mnemonics for Morse code, developed by Basic Telecommunication Corporation (1980). An instructional package, based on this system, is available from the Washington Research Foundation (1983).

USING THE S.MORSE OR T.MORSE SETUP

In this section, you will use the standard codes with each of the Morse code methods. Even if you are sure you do not wish to use the standard codes, we recommend using this section to understand the different Morse code methods and the advantages or limitations of each.

Getting Started

To use this section as a hands-on tutorial, you will need:

- An Adaptive Firmware Card, already installed
- Your copy of the AFC Menu Disk
- 1-2 switches: You may use either:
 - the OPEN-APPLE and OPTION/SOLID-APPLE keys, or
 - two switches connected to the AFC I/O box

NOTE: If you will be using a dual-action **sip-and-puff switch** to send Morse code, the cable from the switch must end in two mini-phone plugs. Connect these to jack #1 (*dit*) and jack #2 (*dah*) on the AFC I/O box. If the switch does not end in two mini-phone plugs, an adaptor may be available from the switch manufacturer or from your local electronics store.

- A copy of the codes (Figures 11-3 and 11-4)

***** CAUTION:** *Make sure the computer is OFF when connecting or disconnecting switches. ****

Tips: Using a Dual-Action Sip-and-Puff Switch to Send Morse Code

Selecting an appropriate switch or switches to send Morse code will depend on factors such as those listed in the FACTORS AND RESOURCES chapter. For people with high level spinal cord injuries, a commonly used switch is the sip-and-puff switch. If you are using a sip-and-puff switch for the first time, some preliminary information will be helpful. Please read below.

If using a sip-and-puff switch does not apply to you, just skip ahead to "Using 2-Switch Morse Code."

For people with high level spinal cord injuries, using a dual-action sip-and-puff switch with automatic-keyer Morse code offers several advantages, including minimal fatigue and potentially high speed. This switch is really two switches in one — sipping activates one switch, puffing activates the other. With training and practice, users have reported Morse code rates as high as 30 words per minute, with very little fatigue. The advantages of this switch are nil, however, if you don't know how to use it.

*A basic misconception is that you use your lungs to operate the sip-and-puff switch — this is not true! It is quite possible to approach the sip-and-puff switch as if it were a straw and hold your breath while using it. This will work, but it is *not* an efficient way to use the switch! The best way to use this switch is to sip and puff with your mouth and tongue and not involve your lungs at all.*

As suggested by Vanderheiden and Enders (1984), you can demonstrate that your lungs do not need to be involved by kissing or sucking on the back of your hand and breathing through your nose at the same time. "You'll notice that creating suction in your mouth is totally independent from breathing. Similarly, puffing is created by reversing the action. As a result, a tracheotomy and/or respirator dependency do not interfere in any way with the use of this technique."

The idea is to control the sip-and-puff switch not by changes in breathing but by subtle movements of your lips and tongue. These subtle movements create changes in the air pressure inside the mouth, and these changes trigger the switch. With training and practice, you can separate your breathing from

sipping and puffing — a proficient user can breathe through the nose while continually sending Morse code (Beukelman, Yorkston, and Dowden, 1985).

For further information on training and use of a dual-action sip-and-puff switch to send Morse code, see "Chapter 3: Keith" in Beukelman, Yorkston, and Dowden (1985). This chapter is a case study of a 25-year-old civil engineer with a spinal-cord injury at the fourth cervical vertebra, including information on his background, his needs and abilities, the intervention, the system selection, and follow-up. The authors explain how Keith was taught Morse code and, once accuracy was achieved, what specific training was involved in increasing his speed in code sending with the sip-and-puff switch.

Using 2-Switch Morse Code

We will begin by exploring the two variations of 2-switch Morse code. The plan will be:

- (1) Select the **S.MORSE** (standard Morse code) or **T.MORSE** setup (talking standard Morse code) from the Extended Menu.
- (2) Use the Make Changes window to change the method to **MORSE 2-SW HI/LOW** and the rate to 5.
- (3) Load the revised setup and bring up the test window.

To do this, you can use the quick steps below or, for more detailed instructions, leave a marker here and go to "Using an 'S' or 'T' Setup" in Chapter 6. Read that section until you see a row of stars (***), then return here.

Quick Steps:

1. Boot the AFC Menu Disk.
 2. Move the cursor to the **S.MORSE** (or **T.MORSE**) setup; press RETURN.
 3. Press RETURN again to get the Choices window on the screen.
 4. Select **MAKE CHANGES IN SETUP**.
 5. Select **METHOD/RATE**.
 6. Respond Y to the caution window, then change the method to **MORSE 2-SW HIGH/LOW** and the rate to 5.
 7. When the Choices window reappears, select **LOAD THIS SETUP**.
 8. When the **SETUP IN EFFECT** window appears, press T to Test the setup.
-

When the test window appears, you are ready to begin exploring two-switch Morse code!

1. Press switch #1 (or the OPEN-APPLE key) and hold it down. Listen to the *dits*. Release the switch.
2. Press switch #2 (or the OPTION/SOLID-APPLE key) and hold it down. Listen to the *dahs*. If you are using the HIGH/LOW variation, the *dahs* should be a lower-pitched tone than the *dits*. If you are using the SHORT/LONG variation, the *dahs* should be three times longer than the *dits*. Release the switch.
3. Try holding each switch down for a certain number of *dits* or *dahs*, then releasing the switch and looking for the letter in the test window.
 - E Press the *dit* switch. As soon as you hear one *dit*, release the switch. Look for E in the test window.
 - • I Press the *dit* switch and hold it closed until you hear the second *dit*, then release the switch. Look for I in the test window.
 - • • S
 - • • • H
 - T Press the *dah* switch. When you hear the first *dah* begin, release the switch. Look for T.
 - — M Press the *dah* switch and hold it closed until the second *dah* begins, then release the switch. Look for M.
 - — — O
 - — — — ← (LEFT ARROW) The cursor in the test window will move one space to the left, just as if you had pressed the LEFT-ARROW key.

Notice that any of the above codes can be sent with only one movement (one switch closure). The difference between these eight characters is which switch you use and how long you hold it closed.

4. Try sending some codes that are a mixture of *dits* and *dahs*, such as:

• – A

– • N

• – • R

– • – K

Notice that if you are using the SHORT/LONG variation, you have more time to move from *dah* to *dit* than you have to move from *dit* to *dah*, because the *dah* tone is three times longer than the *dit* tone. This is not the case in the HIGH/LOW variation, where the *dits* and *dahs* have different tones but are the same length.

5. Try these function codes:

• • – – SPACE (2 movements required)

• – • – RETURN (4 movements required)

6. With the automatic-keyer methods, RATE means how quickly the *dits* and *dahs* are repeated and how long you must pause to register the end of a character. The higher the rate, the more rapidly the signals are repeated. The slowest rate is 1; the fastest is 29. In this tutorial, you are using a rate of 5.

Try sending the codes for A (• –) and R (• – •) again, but, this time, **move between the switches very slowly**. This will give you a feel for the importance of an appropriate keyer rate in Morse code.

If you move very slowly, you will find that, instead of the letter A, you will get ET, and instead of R, you will get ETE or AE or EN. If your movements were this slow (too slow for the keyer), you would want to try a slower keyer rate, one which lets you send letters correctly.

Try sending some codes without waiting for the tones –
– move between the switches as quickly as you can.

If you move between the switches too quickly for the keyer, you will find that you are ahead of the *dits* and *dahs*, resulting in some incorrect letters. If you can comfortably move too quickly for the keyer, you would want to try a faster keyer rate. (Changing rates is discussed in Chapters 4 and 6.)

7. **Continue to practice with letters until you understand the process**, even if the rate isn't just right for you. Refer to Figure 11-3 to select letters for words you want to write, such as your name. Please do not try to send special function codes, such as ESC or REPEAT at this time.

If you need help with the test window, see "'S' or 'T' Setups: Using the Test Window" in Chapter 6. Read until you see a row of stars (***), then return here.

8. **When finished, press the ESC key to exit the test mode.**

After you have explored the HIGH/LOW variation, press ESC two times to return to the Choices window. Select Make Changes ... Method/Rate, and select the SHORT/LONG method. Keep the rate at 5, and try out the new method with steps 1-8 above.

Read below and decide which is your personal preference:
Morse 2-switch *high/low* or Morse 2-switch *short/long*. Later, you will use your preferred method to practice more of the standard codes.

Tips: 2-Switch Decisions

If you decide to use 2-switch automatic keyer Morse code or to recommend it to someone else, two questions may come up:

- Assuming you have decided on a set of switches and on the movements for controlling the switches, which movement or switch should you use for *dit* and which movement or switch should you use for *dah*?

- Should you use the *short/long* method or the *high/low* method?

These decisions may often be simply a matter of learning style or personal preference, but the following observations may be helpful:

- Traditional Morse code, as used by ham radio operators, uses *short/long* signals.
- *High/low* signals offer a stronger auditory distinction between *dit* and *dah* and are more symmetrical and slightly more efficient from a motor point of view.
- With *short/long* signals, because the *dah* tone is three times as long as the *dit* tone, you have relatively more time to release the *dah* switch and get to the *dit* switch.

For example, to send the code *dit-dah-dit*, you must press the *dit* switch, release it and move to the *dah* switch, press the *dah* switch, release it and move to the *dit* switch, then press and release the *dit* switch. When you use *short/long* signals, you have relatively more time to release the (long) *dah* and move to the *dit* than you would using the equal-length *high/low* signals.

If you have better control of one movement or switch than the other, you might want to use the *short/long* method and use the easier-to-release movement for *dit* and the harder-to-release movement for *dah*.

Codes for Characters and Functions

Now that you have the idea of how the 2-switch automatic keyer works, let's try some additional codes in the standard Morse code overlay.

You may use either the *short/long* or *high/low* method. **Get the test window on the screen for the method and rate you want.**

- To use the *short/long* method at a rate of 5, that test window should still be on the screen. Go ahead to "Numbers," below.
- To change the method or rate, press ESC two times to get the Choices window on the screen. Select MAKE CHANGES IN

SETUP and change the method or rate as desired. LOAD the setup and press (or send) T to bring up the test window.

NUMBERS

With the automatic keyer, any number can be sent with just two movements:

•-----	1	-----•••••	6
••-----	2	-----••••	7
•••-----	3	-----•••	8
••••---	4	-----••	9
•••••	5	-----•	0

Notice the pattern in the number codes: all are five units long. The numbers 1-5 begin with 1-5 *dits*, and the numbers 6-0 begin with 1-5 *dahs*.

PUNCTUATION

Punctuation codes are listed in Figure 11-4. Most are fairly long codes, but may only require three movements.

PERIOD	•-•-•-•-	(6 movements required)
?	••-•-••	(3 movements required)

With punctuation codes that you don't use frequently, a mnemonic can be helpful. One type of mnemonic is tonal, where you think of the code as a song or melody. An example follows:

If you are using *short/long* signals, think of the capitalized words as LONG notes in the song. If you are using *high/low* signals, think of the capitalized words as LOW notes in the song. Send each code several times, thinking of the words of the song as you hear the tones.

!	•-••-	a LINE and a DOT
*	•••-•	a star has FIVE points

REPEAT

AFC Morse code provides a REPEAT code which allows you to repeat the previous character or function as many times as desired, with ease. To REPEAT a character:

1. Send the code for the character you want to repeat, such as '!'.
2. Send the code for REPEAT (•••• – –) then press and hold the *dit* switch closed. This will cause the previous character to repeat (at a rate related to your Morse code rate) for as long as you hold or repeatedly press the *dit* switch.
3. When you're ready to stop repeating, press the *dah* switch. (You'll hear a low tone indicating that REPEAT mode has ended.)

The REPEAT function may be used with special functions, as well as letters and punctuation. For example, you might want to move back over the group of characters you just created. To repeat a special function:

- (1) Send the code for the function, such as LEFT ARROW (– – – –).
- (2) Send the code for REPEAT (•••• – –).
- (3) Press the *dit* switch repeatedly (or hold it closed) until the function has repeated as many times as you want.
- (4) When ready to exit REPEAT mode, press the *dah* switch.

If you ever want to speed up or slow down the repeat rate without changing the Morse code rate, you can do so by changing the special option of REPEAT RATE. (See Chapter 5.)

Note: Many of the function codes in Figure 11-3 show a two-letter abbreviation next to the name of the code. This abbreviation is another type of mnemonic to help you remember longer codes. For example, REPEAT shows HM, because you can think of the REPEAT code (•••• – –) as the letters H (••••) and M (– –) run together. HM can be easily remembered as "How Many."

CAPS LOCK VERSUS SHIFT

1. The standard code for CAPS LOCK is (DM): - • • - - When you first load a setup which has a CAPS-LOCK code in the overlay, the AFC CAPS LOCK is OFF, so you get lower-case letters.

You will not get lower-case letters if you are using application software which does not print in lower case. In fact, you might even get strange results — the same results as if you were typing lower-case letters from the Apple keyboard.

To get all upper-case letters (such as "THE"), send the code for CAPS LOCK (- • • - -). You will hear a low tone, indicating selection of the CAPS-LOCK function. Since CAPS LOCK was previously OFF (you were sending lower-case letters), you have just turned it ON: all letters you send with Morse code will now be sent as upper case.

The AFC CAPS-LOCK character is like the CAPS-LOCK key on the computer keyboard: **it toggles you between all-upper-case and all-lower-case.**

2. **To return to all lower-case letters (such as "the"), toggle the CAPS-LOCK function back off by sending the code for CAPS LOCK again.**
3. The standard code for SHIFT is (HN): • • • • - • When the CAPS-LOCK function is off, you can get upper case for one letter only (such as "The"), by first sending the code for SHIFT. You will hear a high tone, indicating the SHIFT function has been activated.

NOTE: If an overlay does not contain a code for CAPS LOCK, all letters sent through Morse code will be automatically sent as upper case.

If an overlay includes CAPS LOCK, the special option of AUTO-CAPS becomes available. Turning on AUTO-CAPS means the AFC will automatically capitalize any letter you send after a period, question mark, exclamation point, or RETURN. (See Chapter 5.)

CONTROL-KEY OR APPLE-KEY SEQUENCES

When you use the Apple keyboard, you are often required to hold down two or more keys at the same time, such as the CONTROL key plus another character or the COMMAND/OPEN-APPLE KEY or OPTION/SOLID-APPLE key plus another one or characters. With the AFC Morse code, you simply send the codes for the characters in sequence.

For more information about CONTROL sequences and APPLE keys, see "'S' or 'T' Setup: Special Characters and Functions" in Chapter 6.

Using 1-Switch Morse Code

If you can use two switches, the 2-switch automatic keyer is definitely the Morse code method of choice. If you cannot comfortably use two switches, however, you may be able to send Morse code with the 1-switch straight-key approach. Two variations are available: Morse code 1-switch HIGH/LOW, where the tone changes to let you know the tone is long enough to be a *dah*, and Morse code 1-switch PLAIN, in which no change in tone occurs. We will explore both of these.

1. To explore the 1-switch methods, **change the method and rate in your setup to one of the 1-switch methods and set the rate to 5.** We suggest starting with 1-SW HIGH/LOW. The steps are:
 - (1) Get the Choices window on the screen (press ESC two times).
 - (2) Select MAKE CHANGES IN SETUP.
 - (3) Select METHOD/RATE.
 - (4) Respond Y to the caution window.
 - (5) Set the method to one of the 1-switch methods and set the rate = 5.
2. After the changes are saved to disk, **LOAD the setup and press T to Test the setup.**

Now you are ready to explore single-switch Morse code.

3. **Press switch #1 and release it immediately.** Look for an E in the test window.

Do this several times, to produce a string of E's. These short key presses are *dits*.

4. **Now press switch #1 and hold it down for approximately one second.** If you are using the HIGH/LOW variation, you will hear a tone change, which lets you know that you have held the key long enough to form a dah. **Release the switch, and look for a T in the test window.** If you are using the PLAIN variation, the tone will not change — you will just have to experiment with how long to hold it down to get a *dah* (T) rather than a *dit* (E).

Do this several times, to produce a string of T's. This will give you a feel for sending *dahs*.

Try making alternate *dits* and *dahs* (E's and T's).

5. **Try sending the codes which you practiced in the automatic keyer section.** The codes are the same, but the technique is different.

- E Press the switch and release it quickly.
- • I Press and release the switch quickly two times in a row, then pause. Look for I in the test window. (If, instead of I, you get two E's, that means you paused too long between the two presses. Try again, making your two *dits* sound close together.)
- • • S Press and release the switch quickly three times in a row, then pause.
- • • • H
- T Press the same switch and hold it closed long enough for a *dah*, then release it. Look for T.
- — M Send two *dahs* in a row, then pause. To send an M, each press must be long enough to be a *dah*, and you must not pause too long between the two signals. Pause after you have sent two *dahs*.
- — — O Send three *dahs* in a row, then pause.

----- ← (LEFT ARROW)

Notice that using the 1-switch straight-key method involves more key presses and more rigorous timing than using the 2-switch automatic-keyer method.

7. Try sending some codes that are a mixture of *dits* and *dahs*, such as:

• — A Send a *dit*, then a *dah*, then pause. (If you pause too long between the signals, you will get ET, rather than A.)

— • N Send a *dah*, then a *dit*, then pause.

• — • R

— • — K

• • — — SPACE

• — • — RETURN

8. By now, you may be developing a feel for how long is *dah* and how short is *dit*, and how long you must pause to end the character — at a rate of 5. (In the 1-switch straight-key methods, RATE means how quickly you must release the switch before a *dit* becomes a *dah* and how long you must pause to denote the end of a character— a higher rate would require you to move more quickly; a lower rate would require you to move more slowly.)

Feel free to try out any of the codes which you learned previously. The codes themselves — what the COMPUTER RECEIVES when a sequence of *dit/dah* signals is sent — are the same as before. The method (1-switch straight key) is different.

Try using the REPEAT feature. Send the code for a character you want to repeat, then the REPEAT code (HM): • • • • — After sending REPEAT, press the switch again and hold it closed. Your character will be repeated as long as you hold the switch closed or if you press and release it quickly. To exit REPEAT mode, release the switch and wait. After a time (related to your Morse code rate), you'll hear a low tone, indicating

that REPEAT mode has ended. Notice that the REPEAT function is a bit trickier in 1-switch Morse code than in 2-switch Morse code.

9. When done, send the code for ESC (--- •), or press the ESC key, to exit test mode.

After you have explored one 1-switch method (eg HIGH/LOW), go back to the Make Changes window and select the other (eg PLAIN). Explore the new variation as above.

A Note on Rate

With the Morse code methods, the RATE for the method (1-29) actually relates to words per minute. If, for example, the Morse code rate = 5, and if you could send Morse code without stopping and without errors, you would be sending code at 5 words per minute.

Turning Off the Morse Code Tones

You can use the special option of CLICK FEEDBACK to turn off the Morse code tones, if desired. (See Chapter 5.)

Using the RedefMorse or T.Redefind Setups

Below the "T" setups on your Extended Menu are two setups titled RedefMorse and T.Redefind. These are the same as the S.Morse and T.Morse setups, respectively, except that two codes in the standard overlay have been *redefined*: SPACE is a short code (• •) and the letter 'T' is a longer code (• • - -). Since SPACE is a very frequently used character, the shorter SPACE code is more efficient than the longer standard code.

Using a Morse Code Setup with Application Software

You have been practicing the Morse code methods by using the AFC test window. To practice Morse code with application software, you could try

Text Demo or Lemonade Stand on your Sample Application Software disk, or any software of your own choosing.

To use application software with any setup:

1. Select and LOAD the setup.
2. When the SETUP IN EFFECT window appears, remove the AFC Menu Disk and put in your application disk. Then press (or send the code for) RETURN.

The application disk will boot, and you can use the Morse code setup to run your application program. (See the preceding tutorial or Figures 11-3 and 11-4 for any special codes or functions.)

Short Cuts for Advanced Users

Selecting setups from the Extended Menu is useful for a beginner, but a quicker way is to use the Quick-Start Menu which appears immediately when you turn on the computer, provided the AFC is turned ON. If the setup you want is on the Quick-Start Menu, you can select the setup from there — without using the Menu Disk at all.

For more information about quickly loading a setup or quickly changing method and rate, see "Short Cuts for Advanced Users" in Chapter 6.

Having Your Setup Active at Startup

The AFC is shipped from the factory with a setup called "Normal" in the #1 position — this means only the Apple keyboard, *not* your Morse code method, is active at startup. To have your method active at startup, all you need to do is move your preferred setup to the #1 position on the Menu Disk.

For instructions, see "Having Your Setup Active at Startup" in Chapter 6.

CREATING YOUR OWN SETUPS

So far, you have tried out the different Morse code methods with the standard overlay in the S.Morse or T.Morse setup. If and when the existing setups do not meet your needs, we recommend that you move beyond the factory-made setups (which are for general use) and create your own setups (for specific use). Your own setup can have a standard, redefined, or customized overlay.

Chapter 7, REFERENCE: ADDING A SETUP, describes, in general terms, the steps involved in planning a setup and designing your own overlay. In this part of the MORSE CODE chapter, we will describe an example that applies to advanced code senders.

- If you are interested in Morse code for motor training or switch control evaluation, use "If You Only Need a Few Keys" in the chapter titled ONE SWITCH, TWO SWITCH, RED SWITCH, BLUE SWITCH.
- If you are a full-access Morse code sender, continue reading this chapter for information on designing an overlay with redefined codes.

Remember that designing and creating a setup may be done by a person who uses the computer keyboard or by a person who uses any AFC method with a full-access overlay. Thus if you are an independent Morse code sender, you can create your own setups and overlays, *provided* you have your full-access Morse code setup in the #1 position on the Extended Menu, above the double-dotted line. (See "Having Your Setup Active at Startup," Chapter 6.)

Examples

Two different options are available to improve the efficiency of standard Morse code with particular application programs. They may be used separately or in combination.

- (1) By using **macros**, discussed in Chapter 17, you can send a string of up to 100 characters by sending as few as two codes: the AFC.MACRO code, followed by the CODE NAME (1-15 characters).

- (2) By **redefining codes in a Morse code overlay**, you can modify or add levels to the standard codes to better suit your application. A redefined code can send one character or a string of up to 100 characters and can provide speech feedback, if desired. Ten levels of codes can be used within one overlay, so you can maintain a level with standard codes for familiar full-keyboard access.

An example application for a redefined Morse code overlay would be to replace the standard codes for numbers with a set of shorter codes known as "quick numbers." This would be useful for using a spreadsheet program or some other program where numbers were used almost exclusively. A possible set of "quick" number codes, designed to resemble Roman numerals, is:

•	I	1	—•	VI	6
••	II	2	—••	VII	7
•••	III	3	—•••	VIII	8
•—	IV	4	•—	IX	9
—	V	5	—	X	0

Another example would be to find code sequences that are not used in the standard overlay and define some of these as frequently used words.

Planning a Setup with Redefined Codes

To plan a setup with redefined codes, you must:

1. **Know your application software** — so you know what characters and character combinations you want new codes for.
2. **Decide what codes you want to redefine and how**, such as changing the numbers to quick codes, as described above.
3. **Decide how to handle lost functions.** When you redefine a code, such as • (E), to be something else, you lose the original meaning of that code (E). Several strategies exist which allow you to redefine the code and still have access to the original meaning.

4. **Decide the speech feedback** (optional) — what you want the speech synthesizer to say after a code is sent — if you want this to be a talking overlay.
5. **Decide the LOCK/REVERT status and FALL-THROUGH status** (for multiple levels) — how you want the AFC to handle level shifts and undefined codes in Levels 2-10.

Each of these activities is described below.

KNOW YOUR APPLICATION SOFTWARE

Before creating a redefined overlay for a particular application program, it is first important to be **very familiar with the application software**. If you've used the application frequently with standard Morse code, you will have a good feel for the codes you want to change.

In our spreadsheet example, we decided that "quick codes" for numbers might allow more efficient data entry.

DECIDE WHAT CODES TO REDEFINE AND HOW

This means deciding the code to be sent (USER SENDS) and how you want that code redefined (what you want the COMPUTER TO RECEIVE when that code is sent). Essentially, you work out which codes you want to change and what you want them to be. Any sequence of signals may be redefined as a **single character** (such as '3') or a **string** of up to 100 characters (such as your social security number). Special keys, such as ESC or RETURN or OPEN-APPLE may be part of the string.

In our example, we want to use • for 1, •• for 2, etc.

DECIDE HOW TO HANDLE LOST FUNCTIONS

A Morse code overlay can have up to ten levels of codes. With a redefined overlay, all codes in Level 1 are standard codes until you redefine them. When you send Morse code, you are using Level 1 until you send a special AFC.LEVEL code (AL) • - - - • • followed by the number of the new level.

When a code is redefined in Level 1, the original character for that code is no longer available in Level 1 of your overlay.

For example, if you redefine • (E) in Level 1 to be something else, the original character (E) for that code is no longer available in Level 1.

When you plan redefined codes, be sure to note the impact of the loss of the original meanings for your application program. A worksheet, such as shown in Figure 11-6, can be helpful.

In Figure 11-6, we first listed the code to be redefined and the new meaning. We then listed the original meaning for each redefined code and the functions which will be lost *in this application* by no longer having the original meaning available *in Level 1 of the overlay*.

If any of the original meanings are important in running the application program (E, I, S, A, T, etc. are clearly important in AppleWorks), various strategies are available to allow you to have redefined codes *without* losing the important original meanings altogether. You can:

- **STAY WITH ONE LEVEL** and
 - select other codes to redefine, rather than the ones you first planned, or
 - go with your original plan but redefine other codes to be the lost original characters (for example, redefining • - - - - to be E or APPLE-E).
- **USE MORE THAN ONE LEVEL**, retaining the original characters in one level (such as Level 1) and putting your redefinitions in a different level (such as Level 2).

Figure 11-6. Worksheet for a (Non-Talking) Redefined Morse Code Overlay

Name of Program: AppleWorks — Spreadsheet (by Apple)

Name of Setup: LEVEL 2 #S

Level #: 2 of 2

Code to be Sent:	Defined as:	Original Meaning	Impact of Loss of Standard Meaning (if this were a redefinition in Level 1 of the standard codes)
USER SENDS	COMPUTER RECEIVES		
•	1	E	no APPLE-E to change cursor
• •	2	I	no APPLE-I to insert rows or columns
• • •	3	S	no APPLE-S to save file
• -	4	A	no APPLE-A to arrange a column
-	5	T	no APPLE-T to set/remove fixed titles
- •	6	N	no APPLE-N to change name of file
- • •	7	D	no APPLE-D to delete rows or columns
- • • •	8	B	no APPLE-B to blank out an entry or entries
• - -	9	W	no APPLE-W for windows: split view of screen
- -	0	M	no APPLE-M to move entries
• - •	APPLE →	R	
- • -	APPLE ←	K	no APPLE-K to calculate all values

If this overlay has more than one level:

LOCK/REVERT status: LOCK

FALL-THROUGH status: ON

In our example, it makes sense to use two levels of codes. We'll make no changes to Level 1, so all the original characters (E, I, S, A, T, etc) will be available there. We'll put the redefined "quick codes" all in Level 2, along with the AFC.LEVEL code (AL)

• - • - • • We'll use Level 2 only for sending quick numbers. If we want to send letters, we'll just switch back to Level 1 by sending the AFC.LEVEL code (• - • - • •) then the active code for the number of the new level (from Level 2, 1 = •).

DECIDE THE SPEECH FEEDBACK (optional)

If you are using speech feedback with Morse code, you also need to plan what you want the speech synthesizer to say after a redefined code is sent. The SPEECH FEEDBACK can be the same as what the COMPUTER RECEIVES (such as the name of a letter or number) or can be completely different. We have not included SPEECH FEEDBACK in the sample worksheets, but it could be inserted, after COMPUTER RECEIVES, as a column labelled USER HEARS.

DECIDE THE LOCK/REVERT STATUS (for multiple levels)

If you will be using a AFC.LEVEL code to enter a new level while using the setup, you will need to decide what should happen after a new level is selected. **Should the AFC REVERT TO LEVEL 1** after a code has been sent in the new level **or LOCK INTO THE NEW LEVEL** until you send another AFC.LEVEL command?

If you choose the REVERT option, you can still lock into a new level by selecting that level twice in a row. (For this to work, the complete AFC.LEVEL command must be available in each level of the overlay.)

In the spreadsheet example, we would usually want to stay in the new level to send several "quick" numbers, so we'll plan to set the LOCK/REVERT status to LOCK.

DECIDE THE FALL-THROUGH STATUS (for multiple levels)

In a multi-level overlay, how do you want the AFC to handle the undefined codes in Levels 2-10? The AFC can **leave the codes undefined** or **use the Level 1 definition**. If you select "use the Level 1 definition," the undefined codes on higher levels will "fall through" to Level 1; that is, they will have the same meaning as in Level 1. If you choose "leave the codes undefined," any codes not defined in Levels 2-10 are will *not* fall through to Level 1 — they will be null.

In our example, we have redefined some codes as quick numbers in Level 2. But while using Level 2 we would also want to use standard codes for ARROWS, RETURN, DELETE, the AFC.LEVEL COMMAND, etc. We will plan to select "use the Level 1 definition."

Creating the Setup on Disk

Before creating a setup on disk, it's helpful to have a quick overview of the process:

Extended Menu → Construction Programs → Extended Menu
(ADD A SETUP) (CREATE, SAVE, QUIT) (LOAD and use setup)

First you select ADD A SETUP from the bottom of the Extended Menu. This takes you to the setup Constructions Programs — you select a method and create an overlay. When done, you SAVE the setup on disk, then QUIT. Selecting QUIT takes you back to the Extended Menu, where you can LOAD the setup in the usual way and use it with an application.

Each screen and each step is described in detail in Chapter 7. The only variations relating to Morse code are:

- The screen will use the word "code," rather than "item," eg.
"Indicate code user sends," rather than "Indicate item user selects."
- To "indicate code," you can:
 - use switches connected to the I/O box
 - use the COMMAND/OPEN-APPLE and OPTION/SOLID-APPLE keys
 - use the PERIOD on the Apple keyboard for *dit* and the COMMA, SLASH, or HYPHEN for *dah*

SUMMARY WITH "QUICK-NUMBERS" EXAMPLE

Quick steps for creating a setup are given below. Instructions for the Quick-Numbers example are in small *italics* — you'll need to have your worksheet (Figure 11-6) available to work from. For more detailed instructions, without the Quick-Numbers example, use "Creating the Setup on Disk" in Chapter 7. (The step numbers below and in Chapter 7 are the same. A step marked "b" here is unique to Morse code.)

Getting Started

1. Boot the Menu Disk. Press '9' (or use SPACEBAR or ARROWS) to select ADD A NEW SETUP from the bottom of the Extended Menu.

2. From the list of input methods, select MORSE CODE.
3. Enter a TITLE.
4. Select the TYPE OF OVERLAY: customized, standard, or redefined standard.

For Quick Numbers, select REDEFINED STANDARD.

5. Select your SPEECH-FEEDBACK choice.
- 5b. Select a MORSE CODE METHOD and RATE.
6. When the CREATE OVERLAY MAIN MENU appears, you can begin defining codes in any level of the overlay.
 - To work with Level 1, select WORK WITH OVERLAY.
 - To work with another level, select USE LEVELS, then select CHANGE LEVELS.
 - When you have finished the overlay, you will select TEST/SAVE/QUIT.

For Quick Numbers, select USE LEVELS ... CHANGE LEVELS, then select LEVEL 2. (We decided to leave all the codes in Level 1 as standard codes.)

7. A prompt to turn on your AFC may appear.

Basic Steps

You are now ready to begin defining codes. The basic steps for each code will be (don't do this yet):

- (1) Indicate code user sends.
- (2) Enter characters computer receives.
- (3) Enter speech feedback user hears (if you opted for speech feedback).
- (4) When you have programmed a good part of the overlay,. select TEST/SAVE/QUIT and SAVE your work to disk.

8. To **INDICATE CODE USER SENDS**, you can use switches connected to the I/O box or certain keys on the Apple keyboard:

Dit

switch #1
OPEN-APPLE
PERIOD

Dah

switch #2
OPTION/SOLID-APPLE
COMMA, SLASH, or HYPHEN

When you use the PERIOD, COMMA, SLASH, or HYPHEN keys, the signals will appear on the screen as PERIODS for *dits* and HYPHENS for *dahs*. When the signal is complete, press RETURN.

9. The screen changes to show the code you sent in brackets < >. To **ENTER CHARACTERS COMPUTER RECEIVES**, press the keys (or send the standard codes) for the character or characters you want the computer to receive when the **USER SENDS** code is sent.

CAUTION: In most cases, you can directly enter the characters you want in **COMPUTER RECEIVES**. Special considerations, however, are: upper versus lower case and "special" characters such as LEFT ARROW, RIGHT ARROW, ESC, RETURN, or the APPLE keys. *To enter "special" characters, press ESC when the screen shows "Enter characters computer receives," then select the character you want from the special-character window. For help or a listing of special characters, see Chapter 7, step 9.*

For Quick Numbers, use the worksheet (Figure 11-6) as a guide: define all the codes. Do the numbers first: those are not "special" characters.

When ready for OPEN-APPLE RIGHT ARROW and OPEN-APPLE LEFT ARROW, press ESC for the special-character window.

10. If you selected a speech synthesizer, the screen will show **ENTER SPEECH FEEDBACK USER HEARS**. For details, see Chapter 7, step 10.
11. When the screen changes, you can press SPACEBAR to hear the speech again. Your choices are at the bottom of the screen. If everything is as you want it, just press return to **PROCEED TO NEXT CODE**.

12. Repeat steps 8-11 to PROGRAM EACH CODE you want to redefine. The following information is available in Chapter 7:

- | | |
|---------------------------------------|------------------------|
| 9. Enter characters computer receives | 17. Test it! |
| 10. Enter speech feedback user hears | 18. Change method/rate |
| 13. Changing or deleting entries | 19. Continue creating |
| 14. Listing contents | 20. Quitting |
| 15. Free memory | 21. Multiple levels |
| 16. Saving your work | |

LOCK/REVERT and FALL-THROUGH

In a multi-level overlay, setting the LOCK/REVERT status and the FALL-THROUGH status will be important in the successful use of your setup. Selections for LOCK/REVERT and FALL-THROUGH are listed on the Use Levels Menu, which you select from the Create Overlay Main Menu. If you need help, see Chapter 7.

For Quick Numbers, set the LOCK/REVERT status to "lock" and the FALL-THROUGH status to "use the Level 1 definition."

Test/Save/Quit

To use the new setup, you must first SAVE it on disk. In fact, it is a good idea to save your work fairly often (such as every 10 minutes), even if you are not done. To save the setup you are working on, **follow the prompts on the screen to return to the Create Overlay Main Menu.** From the Create Overlay Main Menu, select **TEST/SAVE/QUIT**, then select **SAVE TO DISK.**

You can also select TEST IT! from the Test/Save/Quit choices, to test your setup in a Test Run window. (For details, see Chapter 7.)

To use the setup with your application software, you must first return to the Extended Menu. The safest way to do this is to select QUIT from the Test/Save/Quit choices. The screen will then offer the choices: **CREATE ANOTHER SETUP** or **EXIT TO EXTENDED MENU.**

If, while using the Create Overlay program, you added an AFC.MACRO character to the overlay, the screen will also offer the choice **WORK**

WITH MACROS. (See Chapter 17 for details about macros and the Macro Manager program.)

If you are ready to use your setup with application software, select EXIT TO EXTENDED MENU.

Using or Changing the Setup

When you return to the Extended Menu, the new setup will be at the end of the menu. Your options include:

- Completing the Description window for this setup: press RETURN to bring up the Choices window, then select MAKE CHANGES ... DESCRIPTION.
- Trying out the setup with your application program: press RETURN to bring up the Choices window, then select LOAD THIS SETUP.
- Making changes in method, rate, overlay, or special options: press RETURN to bring up the Choices window, then select MAKE CHANGES ... then select the part of the setup you want to change.
- Moving the setup to any location on the Extended Menu, including the fixed Quick-Start Menu: highlight the setup, press CONTROL-R, then use ARROWS to move the setup.

See Chapter 6 for help with any of these options.

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CHAPTER 12

SCANNING

This chapter will provide detailed information regarding the scanning methods, including using the different methods, using the standard overlays, and creating your own setups and overlays. We assume you have read the Introduction and Chapters 1-2 and have made use of the hands-on demos in those chapters. Experience with the AFC demo (Chapter 1) and the Menu Disk demo (Chapter 2) is recommended as an introduction to AFC scanning. A quick view of the scanning methods is available in Chapter 3.

WHAT IS SCANNING?

The AFC scanning methods were designed for the person who can control one or two switches and can track and interact with a moving cursor: a pointer (called a "cursor") moves through a series of choices on one line of the computer screen — you press or release a switch when the desired item is reached. The location of the scan line is usually the second-to-bottom line of the computer screen, but you can move this to a different location. The advantage of scanning is that you only need to be able to use one switch.

With AFC scanning, **how the cursor moves when you press the switch and how you use the switch to make a selection** is part of the particular scanning METHOD you select. Four methods are available. In **regular** scanning and **regular scan (ongoing)**, the cursor moves by itself. In **step** scanning, you advance the cursor by pressing the switch repeatedly. In **inverse** scanning, you hold the switch closed to make the cursor move. These methods will be discussed in detail later.

RATE means how quickly the cursor moves and how quickly you must handle the switch: a range of rates is available within each method.

Overlays

With AFC scanning, **the way in which characters for scanning are displayed and defined** is called the OVERLAY. Several terms are helpful when describing a scanning overlay:

When you press the switch, the single line of choices that appears is called an ARRAY. As the cursor moves, it highlights the array in SEGMENTS. The segment length can be anywhere from one to 40 characters long.

The cursor moves across the array in either a simple or complex pattern. In the simple, ONE-AT-A-TIME pattern, the cursor points to each word or character. In the more complex, GROUP-ITEM pattern, the items are displayed as groups of single characters on the array, and the cursor moves first through groups, then through the single items within a group.

When you select an item from the array, the AFC takes information stored in the item and sends this to the Apple. We call this COMPUTER RECEIVES. The COMPUTER RECEIVES for an item can be a single character or a string of up to 100 characters.

While you can only see one array at a time, a scanning overlay can have as many as 10 different arrays. A process called BRANCHING allows you to move from one array to another.

TYPES OF OVERLAYS

STANDARD overlays are intended for general use in situations where access to all keyboard characters is important. Two standard scanning overlays are available. Each consists of three interbranching arrays, containing all of the keys available on the Apple keyboard, arranged for general-purpose use.

The difference between the two standard overlays is that the STANDARD ABC overlay displays letters in alphabetical order, whereas the STANDARD ETA overlay displays letters in a statistically ordered arrangement. The alphabetical arrangement might be useful in first introducing or studying the scanning method, but a statistical arrangement of letters is considered, in the long run, to be a more efficient arrangement when a person is producing text by means of scanning.

The standard scanning overlays are displayed in Figure 12-1.

Figure 12-1. Standard ABC and ETA Overlays

Standard ABC Overlay:

```
_R<#. +ABCDE\FGHIJ=KLMNO PQRST UVWXY Z. ^*  
_R<A.0123 4567 89. + * - / =  
QEC>^V.,?!; " # $ % & ' ( ) * + - @ / : < = > [ \ ] ^ ` AODT
```

Standard ETA Overlay:

```
_R<#. +EOHWY\TIRUP=ANLBK SMFVQ DCXJZ G. ^*  
_R<A.0123 4567 89. + * - / =  
QEC>^V.,?!; " # $ % & ' ( ) * + - @ / : < = > [ \ ] ^ ` AODT
```

Virtually all commercial software will work with the standard overlay. You simply use your standard scanning overlay in place of the Apple keyboard. (You will try this out later in this chapter.)

REDEFINED overlays are modifications of the standard scanning overlay. For example, you may wish to change the location of certain characters, or add additional arrays, such as an array with the editing commands for your word processing program.

CUSTOMIZED overlays are created "from scratch" — they most likely do not resemble the standard overlay at all. These are usually created for a given application, such as the UP DOWN LEFT RIGHT overlay in the Up Down setup (the AFC demo in Chapter 1).

With the AFC Menu and Construction Disk, you can create complex or very simple overlays for particular programs, using only the characters required to operate those programs. (Often this is a small subset of the entire alphabet.) When you create a your own overlay, you may:

- use whole words on an array, rather than single letters
- set up an array for one-at-a-time or group-item scanning
- create up to 10 interbranching arrays within an overlay
- arrange characters in an order allowing efficient access to those most frequently needed in the application program
- use your overlay with any of the scanning methods, described below

Examples of very simple customized arrays are shown in Figure 12-2.

Figure 12-2. Examples of Customized Arrays

Application Software: Charlie Brown's ABC's

Desired Input: A (for Snoopy wearing an apron and popping corn)
B (for Charlie batting the ball)
C (for Snoopy blowing out candles on the cake)
F (for Charlie kicking the football)

Example #1 (one-at-a-time array, single letters):

A B C F

Example #2 (one-at-a-time array, whole words):

POP BAT CAKE KICK

THE SPEECH FEEDBACK OPTION

When speech feedback is part of a scanning overlay, the items on the scanning overlay can be "spoken" aloud by a speech synthesizer as the cursor moves from item to item. What you have, in effect, is a "talking" scanner.

The AFC speech feedback option allows **the addition of speech to the scanning overlay** but does *not* add speech to the application program.

A talking scanner may be very helpful to users who have difficulty reading the scanning array or to developmentally younger users who are trying to grasp the concept of scanning. While the quality of voice in some synthesizers may be initially disappointing, most people, especially children, adjust rapidly to the way words are pronounced. The capability of adding speech to a scanning overlay can open up interesting possibilities in many applications.

For information about using the speech feedback option, see "Using AFC Speech Feedback," Chapter 3.

OPTIONAL SCAN SIZE AND SCAN LINE

The size of the characters on the scanning array is usually the normal 1/4-inch computer-size. This allows you to have 40 characters in one array, spread out across the screen. These are displayed in 40-column or 80-column text, depending on your application program.

If you want larger characters, you can use the AFC special option of **SCAN SIZE** to set the size to medium or large. Medium size = 40-column graphic characters. Large size = 20 column graphic characters (**approximately 1/2-inch high**). With the large-size scan, only **20 characters** will appear in any array, but they will be *very* visible. Large size takes effect only in programs which use full-screen graphics, such as Alex the Rabbit. (For a demo, see the AFC demo in Chapter 1.)

If you want to move the scan line from its usual second-to-bottom-line location, you can use the AFC special option of **SCAN LINE** to set the line anywhere on the computer screen. (0 = top line, 23 = bottom line.)

Scanning Methods

Four scanning methods are available, regardless of the overlay used. These are called REGULAR SCAN, REG.SCAN (ONGOING), STEP SCAN, and INVERSE SCAN.

REGULAR SCANNING

You only need one switch: you can use switch #1 *or* switch #2 (or the corresponding OPEN-APPLE or OPTION/SOLID-APPLE key). When you press the switch (or the APPLE key), the scanning overlay will appear at the bottom of the screen. **When you release the switch, the pointer (called the "cursor") will begin scanning (moving across the array).** How quickly the cursor moves through the array will depend on the scanning rate you selected. To make a selection, **wait until the cursor is on the group or item you want, then press the switch.**

In **one-at-a-time regular scanning**, the cursor moves from item to item. To select an item, wait until the cursor is on that item and press the switch — whatever is stored for that item will then be sent to the computer. This might be a single character, a string of characters, and/or a special function.

In **group-item regular scanning**, the cursor first moves from group to group. To select a group, wait until the cursor is on the group you want, then press the switch. When you release the switch, the cursor begins moving from item to item within that group. When the cursor is on the item you want, press the switch again — whatever is stored for that item will then be sent to the computer, as described above.

REG.SCAN (ONGOING)

Reg.scan (ongoing) is a slight variation of the regular scan method.

In **regular scanning**, when you select an item from the array, the AFC sends whatever is stored for that item to the computer, and the array disappears. To bring the array back up, you must press the switch again. The advantage here is that the full

computer screen is available for the application program; the array appears only when you press the switch.

In **reg.scan (ongoing)**, when you select an item from the array, the array automatically reappears and the cursor begins scanning again. This means that only two switch closures, rather than three, are required to select an item. This method, therefore, is the more efficient method in an application where you are primarily generating your own text, as when using a word processor. If no character is selected, or if RETURN is selected, then the array will disappear until you press the switch again.

AFC regular scan and reg.scan (ongoing) are the traditional single-switch scanning methods frequently used in communication devices and switch-input software. This type of scanning is very popular and works well for many people. Regular scanning, however, may be difficult for some users, such as people who have trouble planning their movements to match the anticipated movements of a moving cursor or for very young users who may be confused by the complexity of the task. For some people, a different method (step scanning or inverse scanning, see below) may offer more direct control without the pressure of anticipation.

STEP SCANNING

You only need one switch: switch #1 *or* switch #2. When you press the switch (or the APPLE key), the scanning array will appear at the bottom of the screen. When you release the switch, however, you should be planning to press it down again. This is because in step scanning, you are not watching a cursor that moves by itself. In step scanning, you **press the switch repeatedly to move the cursor across the array**. (Each press of the switch moves the cursor one step.) To make a selection, **move the cursor until it is on the group or item you want, then release the switch and wait**.

In **one-at-a-time step scanning**, each time you press the switch, the cursor moves to the next item. To select an item, press the switch repeatedly to step the cursor to the item you want, then release the switch and wait. After a specified delay

time (related to the rate you selected), whatever is stored for that item will be sent to the computer.

In **group-item step scanning**, when you first begin pressing the switch, the cursor will be stepping from group to group. When the cursor is on the group you want, release the switch and wait. After a specified delay time, the group you selected will be selected. Next, press the switch repeatedly to advance item by item within the group. When the cursor is on the item you want, release the switch and wait. After the specified delay time, whatever is stored for that item will be sent to the computer.

In step scanning, the speed of cursor movement is always controlled by how you release and press the switch. The **rate** you select in step scanning does not determine the speed of cursor movement, but it does determine **how long the AFC will wait**, after you release the switch, before it assumes that the group or item under the cursor is the one you want. The higher the number, the more quickly the AFC responds after you release the switch.

For **two-switch step scanning** (switch #1 moves the cursor, switch #2 selects the item), set the rate = 0.

Step scanning may be preferable as a input method for some individuals. Examples include:

A person may have difficulty anticipating and responding to an independently moving cursor: In step scanning, the number of movements required to select an item is greater than in regular scanning, but the cursor is under more direct control. In some situations, using step scanning may help a person gradually develop the motor planning abilities to use regular scanning or inverse scanning.

A very young (or developmentally young) person may be confused by the complexity of regular scanning: In step scanning, there is a more direct relationship between pressing the switch and seeing the cursor move to the next item. Rather than "wait until the pointer gets to what you want, then press the switch," you are saying "move the pointer to the one you want (then wait)." Step scanning is very similar to counting out a line

of objects — each press of the switch is similar to moving your finger (a pointer) to the next object.

INVERSE SCANNING

You can use one *or* two switches. When you press switch #1 (or OPEN-APPLE), the scanning array will appear at the bottom of the screen. Once the array appears, your use of the switch is the opposite, or inverse, of regular scanning. In inverse scanning, **while you hold the switch closed, the cursor will begin moving across the array.** How quickly the cursor moves through the array will depend on the scanning rate you selected. To make a selection, **wait until the cursor is on the group or item you want, then (1) release switch #1 and wait a set period of time OR (2) release switch #1 and press switch #2.**

In inverse scanning, the **rate** you select determines how quickly the cursor moves and how long the AFC will wait, after you release the switch, before it assumes that the group or item under the cursor is the one you want. The higher the number, the more quickly the cursor moves and the more quickly the AFC responds after you release the switch.

If holding the switch closed long enough and releasing it at the right moment are difficult, two strategies may be helpful:

- (1) You can either **hold the switch closed or press the switch repeatedly** (as in step scanning) **at any time.** In other words, you do not have to hold the switch closed continuously to make the cursor move. You can release the switch at any time, then press it again — as long as you do not stay off the switch too long. (You would adjust the rate to make this work for you.) This means you could hold the switch down as the cursor moves toward the item you want, then, as it gets close to your item, release the switch, and press it repeatedly to step the cursor to the item.
- (2) If you can use **two switches**, you can set the inverse scanning **rate to zero** (no movement), then use *switch #1 to step scan* and *switch #2 to make the selection.* This would virtually eliminate the pressure of anticipation related to a moving cursor and would require no waiting for the AFC to accept an item.

AFC inverse scanning is similar to "directed scanning," used with a joystick or 2-5 switches in many communication devices, but in AFC inverse scanning, you use only 1 or 2 switches and the cursor moves in only one direction.

Figure 12-3 summarizes the AFC scanning methods.

Figure 12-3. Summary of AFC Scanning Methods

	<u>Regular Scanning & Reg.Scan (Ongoing)*</u>	<u>Step Scanning</u>	<u>Inverse Scanning</u>
To bring up the array	press the switch	press the switch	press switch #1
To start the cursor moving	release the switch	release the switch and press it again	hold switch #1 closed
The cursor will continue to move	on its own	each time you release and press the switch	whenever switch #1 is closed
To select an item	<u>wait</u> until the cursor is on the item	<u>continue to release and press the switch</u> until the cursor is on the item	<u>hold switch #1 closed</u> or press it repeatedly until the cursor is on the item
	then <u>press the switch</u>	then <u>release the switch and wait</u>	then <u>release switch #1 and wait</u> OR <u>release switch #1 and press switch #2</u>

* Reg.Scan (Ongoing) is the same as Regular Scanning except that after you make any selection except RETURN, the array automatically reappears.

USING THE S.SCAN OR T.SCAN SETUPS

In this section, you will use the standard ABC and ETA overlays with each of the scanning methods. Even if you are sure you do not wish to use a standard overlay, we recommend using this section to understand the different scanning methods and the special characters and features available in AFC scanning.

Getting Started

To use this section as a hands-on tutorial, you will need:

- An Adaptive Firmware Card, already installed
- Your copy of the AFC Menu Disk
- 1-2 switches: You may use either:
 - the OPEN-APPLE and OPTION/SOLID-APPLE keys, or
 - one switch connected to jack #1 on the AFC I/O box. If available, a second switch should be connected to jack #2 on the I/O box.
 - one or two halves of the Unicorn keyboard. The right half is switch #1; the left half is switch #2. With the Unicorn Keyboard Model I (yellow), use of a dead-spot eliminator is recommended (see the chapter titled FACTORS AND RESOURCES).

***** CAUTION:** *Make sure the computer is OFF when connecting or disconnecting switches. ****

Using Regular Scanning

The plan will be:

- (1) Select the **S.Scan.ABC** (standard ABC) or **T.SCAN.ABC** (talking standard ABC) setup.
- (2) Use the Make Changes window to set method to **REGULAR SCAN** and the rate to 7.
- (3) Load the revised setup and bring up the test window.

To do this, you can use the quick steps below or, for more detailed instructions, leave a marker here and go to "Using an 'S' or 'T' Setup" in Chapter 6. Read that section until you see a row of stars (***), then return here.

Quick Steps:

1. Boot the AFC Menu Disk.
 2. Move the cursor to the **S.Scan.ABC** (or **T.Scan.ABC**) setup; press RETURN.
 3. Press RETURN again to get the Choices window on the screen.
 4. Select **MAKE CHANGES IN SETUP**.
 5. Select **METHOD/RATE**.
 6. Respond Y to the caution window, then set the method to **REGULAR SCAN** and the rate to 7.
 7. When the Choices window reappears, select **LOAD THIS SETUP**.
 8. When the **SETUP IN EFFECT** window appears, press T to Test the setup.
-

When the test window appears, you are ready to begin exploring the method and overlay.

1. **Press the switch** (or the APPLE key) **and hold it down**. An alphabet array will appear at the bottom of the screen.
2. **Release the switch** — the cursor will begin moving. In regular scanning, the rate at which the cursor moves is determined by the rate in that setup. The higher the rate, the faster the cursor moves. The rate of 7 in this setup is a moderate rate (one is very slow; 29 is very fast).

3. Use the switch to select a letter from the array:

- (1) Decide on a letter you'd like to print.
- (2) Locate the letter in the scanning array. (If the array has disappeared, press the switch again and hold it down while you locate the letter. When you have found the letter, release the switch.)
- (3) This is a GROUP-ITEM scan. When the cursor reaches the group with your letter, **press and release the switch.**
- (4) When the cursor reaches the letter you want within the group, **press the switch again.**

The letter you selected will appear in the test window.

4. **Continue selecting letters from this array until you understand the process.** Please ignore the first and last groups of characters and select letters only from the other groups at this time.

The method you are using is regular scanning and the overlay is the standard ABC overlay. This overlay actually consists of three arrays and includes all the characters and functions on the Apple keyboard. We will next explore the standard ABC overlay in detail.

If you are not familiar with the rules and limitations of the test window, please read "'S' or 'T' Setups: Using the Test Window" in Chapter 6. Read until you see a row of stars (***), then return here.

The Standard ABC Overlay

The standard ABC and standard ETA overlays each consist of three arrays. The two overlays differ only in how the alphabet letters are arranged. Some of the characters shown in the arrays are actually special functions. The arrays and their functions are shown in Figure 12-4. We will now try out those functions using the ABC overlay .

Figure 12-4. Details of the Standard ABC and ETA Overlays

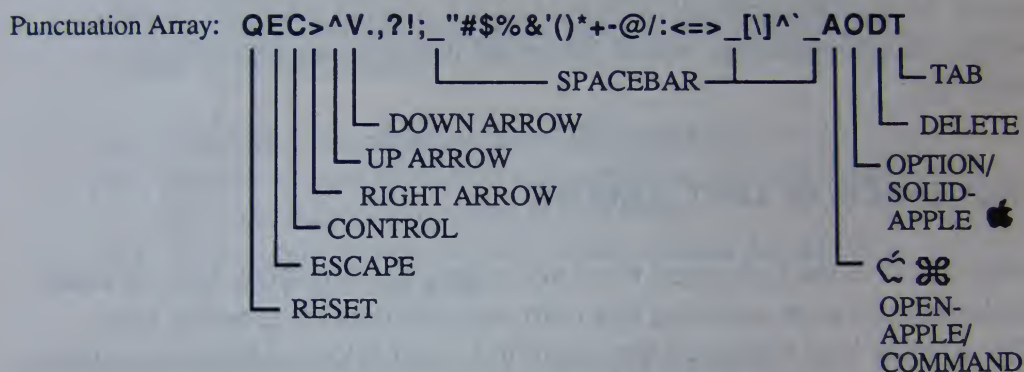
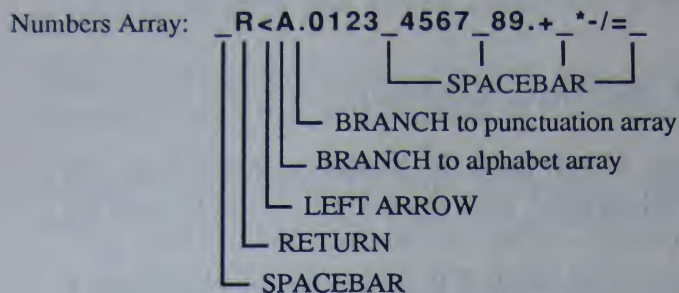
Alphabet Arrays:

ABC: _R<#. + ABCDE\FGHIJ=KLMNO_PQRST_UVWXY_Z.^*
ETA: _R<#. + EOHWY\TIRUP=ANLBK_SMFVQ_DCXJZ_G.^*

- SPACEBAR
- MOUSE/JOYSTICK character
- CAPS LOCK
- SHIFT
- MACRO character
- REPEAT last selection
- BRANCH to punctuation array
- BRANCH to numbers array
- LEFT ARROW
- RETURN
- SPACEBAR

(continued on next page)

Figure 12-4, continued.



To obtain these characters select SHIFT followed by

{	^	[
}	^]
	^	\
~	^	`
_	^	-

Notice in Figure 12-4 that the first and last groups of characters in the alphabet array have special meanings, including RETURN, LEFT ARROW, BRANCHING COMMANDS, REPEAT, SHIFT, and CAPS LOCK.

Special Characters

If you are using this as a tutorial, **try using the scanning array to write a word**, such as your name. Try out the following special functions as you need them or in the order listed.

VIEWING WITHOUT A MOVING CURSOR

In regular and step scanning, **if you hold the switch closed when you first press it, the array will appear** with the cursor on the first group but **without the cursor moving** — when you are not familiar with an array, this can be a useful way to locate an item without the distraction of a moving cursor. When you have located the item you want, release the switch. In regular scanning, the cursor begins moving when you release the switch. (In step scanning, release the switch and press it again to begin stepping.)

BACKSPACE or LEFT ARROW

Select the '<' in the first group when you want a LEFT-ARROW key. In most application software, selecting this LEFT-ARROW item (or pressing your LEFT-ARROW key) will cause the cursor to move back one character on your screen.

SPACEBAR and RETURN

Select any blank spot on the array — including the space at the beginning of the first group — to send a SPACE.

Select the 'R' in the first group for RETURN.

REPEAT

AFC scanning provides a REPEAT character which allows you to repeat the previous character or function as many times as desired, with ease. To REPEAT a character:

1. Use the switch to select the character you want to repeat, such as 'X'.
2. The REPEAT character is the '+' (plus sign) at the end of the first group in the alphabet array. **Select the REPEAT character (the '+') and continue to hold the switch closed or press it repeatedly.**

This will cause the previous character, such as 'X', to repeat (at your scanning rate) for as long as you hold or repeatedly press the switch.

3. **When you're ready to stop repeating, release the switch and wait.** (You'll hear a tone when repeat mode has ended.)

The REPEAT function may be used with special functions, as well as letters and punctuation. For example, you might want to move back over the group of letters you have created. To repeat a special function:

- (1) **Select the function**, such as LEFT ARROW.
- (2) **Select '+' and hold down the switch** until the function has repeated as many times as you want.
- (3) **When ready to exit REPEAT mode, release the switch and wait for the tone.**

This repeat method, where you *hold down or repeatedly press* the switch to continue the repeat, **can be changed**. Setting the special option of REPEAT METHOD = 1 allows you to manage the repeat more like regular scanning: after you select the REPEAT CHARACTER, you *press and release* the switch to begin the repeat, then press the switch again to stop it.

If you ever want to speed up or slow down the repeat rate without changing the scanning rate, you can do so by changing the special option of REPEAT RATE. (See Chapter 5.)

To change REPEAT METHOD or REPEAT RATE while using an application (not the test window), you can CONTROL-A 2, described in Chapter 4. To change special options from the Extended Menu, you can back up to the Make Changes window and select special options. If you are using this as a tutorial, just keep in mind that the REPEAT METHOD and the REPEAT RATE can be changed.

CAPS LOCK VERSUS SHIFT

1. The CAPS-LOCK scanning character is the '*' (asterisk) at the end of the last group on the alphabet array. When you first load a setup which has a CAPS LOCK character in the overlay, the AFC CAPS LOCK is OFF, so you get lower-case letters.

You will not get lower-case letters if you are using application software which does not print in lower case. In fact, you might even get strange results — the same results as if you were typing lower-case letters from the Apple keyboard.

To get all upper-case letters (such as "THE"), select the CAPS-LOCK character (the '*'). You will hear a low tone indicating selection of the CAPS-LOCK function. Since CAPS LOCK was previously OFF (you were getting lower-case letters), you have just turned it ON: all letters you select from the scanning array will now be sent as upper case.

The AFC CAPS-LOCK character is like the CAPS-LOCK key on the computer keyboard: **it toggles you between all-upper-case and all-lower case.**

2. **To return to all lower-case letters (such as "the"), toggle the CAPS-LOCK function back off by selecting the CAPS-LOCK character again.**

In scanning, the CAPS-LOCK function does not change how the array looks, but it does change the letters sent from the array from upper case to lower case or vice-versa.

3. The SHIFT scanning character is the '^' (caret) in the last group of the alphabet array. **When the CAPS-LOCK function is off, you can get upper case for one letter only (such as "The"), by first selecting the SHIFT character (the '^').** You will hear a high tone, indicating the SHIFT function has been activated.

NOTE: If a scanning overlay does not contain a CAPS-LOCK character, all scanning letters will be automatically sent as upper-case.

If an overlay includes CAPS LOCK, the special option of AUTO-CAPS becomes available. Turning on AUTO-CAPS means the AFC will automatically

capitalize any letter you send after a period, question mark, exclamation point, or RETURN. (See Chapter 5.)

NUMBERS

1. To get to the numbers array, **select the '#' (number sign) in the first group** of the alphabet (or punctuation) array.

The '#' in this first group is a **branching command** which will call up the numbers array, which includes numbers and math symbols.

2. In the numbers array, the SPACE, R, and LEFT ARROW in the first group have the same meanings as in the alphabet array.
3. Once you bring up the numbers array, you will stay in that array until you branch out of it. **To exit to the alphabet array, select the letter A in the first group. To exit to the punctuation array, select the '.' (PERIOD) in the first group.** These are branching commands to the alphabet and punctuation arrays, respectively.

PUNCTUATION

A period is available near the end of the alphabet array and some math-related characters are available near the end of the numbers array. The punctuation array, however, contains *all* the punctuation-type characters on the Apple keyboard plus several very important special functions such as RESET, ESC, CONTROL, RIGHT-, UP-, and DOWN-ARROWS, OPEN-APPLE and OPTION/SOLID-APPLE, DELETE, and TAB (see Figure 12-4).

1. To get to the punctuation array, **select the '.' (PERIOD) in the first group** of the alphabet or numbers array.
2. The punctuation array is different from the other two arrays in two respects: (1) If no selection is made, the cursor will automatically go through the array a second time, and (2) this array has no branching commands. **To exit this array, you must select one of the characters on it.** Once you select a character, you will automatically branch to the alphabet array.

CONTROL-KEY OR APPLE-KEY SEQUENCES

When you use the Apple keyboard, you are often required to hold down two or more keys at the same time, such as the CONTROL key plus another character or the COMMAND/OPEN-APPLE KEY or OPTION/SOLID-APPLE key plus another one or characters. With AFC scanning, you simply select the required items in sequence.

For more information about CONTROL sequences and APPLE keys, see "'S' or 'T' Setup: Special Characters and Functions" in Chapter 6.

If you are using this as a tutorial, **select the ESC item (the 'E' in the first group of the punctuation array)**, or press the ESC key to exit the test mode.

The Standard ETA Overlay

The standard ETA overlay differs from the standard ABC overlay only in how the alphabet letters are arranged. Most of us find it easiest to locate particular letters when they are arranged in alphabetical order, but if you were going to use scanning as your method of sending text, the statistical arrangement of letters, once you've learned it, will save you time and effort. To try out the ETA overlay:

1. **Go back to the Extended Menu and LOAD the S.SCAN.ETA setup.** The steps are:

Quick Steps:

1. Return to the Extended Menu (press ESC several times).
 2. Move the cursor to the S.Scan.ETA (or T.Scan.ETA) setup; press RETURN.
 3. Press RETURN again to bring up the Choices window.
 4. Select MAKE CHANGES IN SETUP.
 5. Select METHOD/RATE.
 6. Set the method to REGULAR SCAN and the rate to 7.
 7. When the Choices window reappears, select LOAD THIS SETUP.
 8. When the SETUP IN EFFECT window appears, press T to Test the setup.
-

2. **You may now practice using the standard ETA overlay, as you did with the ABC overlay.** The only difference is that the letters in the alphabet array are arranged differently.
3. **When you are finished exploring this set of arrays, go to the punctuation array and select E (for ESC), or press ESC on the keyboard, to exit test mode.**

Now that you are familiar with the standard ABC and ETA overlays, the next sections will show you how to use these overlays with the other scanning methods. You can use whichever of the S.Scan or T.Scan setups is your preference — ABC or ETA.

Using Reg.Scan (Ongoing)

Reg.scan (ongoing) is the same as regular scanning, except that after an item is selected from the array, the array automatically reappears and the cursor begins scanning again. If no character is selected, or if RETURN is selected, the array will disappear until you press the switch again.

This means that only two switch closures, rather than three, are required to select a letter. This method, therefore, is the more efficient method in an application where you are primarily generating your own text, as when using a word processor. To try out this method, decide which of the S.Scan or T.Scan setups you'd like to use, then:

1. **Go back to the Extended Menu, change the method in your setup to REG.SCAN (ONGOING), then load the setup.** The steps are:

-
1. Return to the Extended Menu (press ESC several times).
 2. Move the cursor to your preferred setup; press RETURN.
 3. Press RETURN again to bring up the Choices window.
 4. Select MAKE CHANGES IN SETUP ... METHOD/RATE.
 5. Set the method to REG.SCAN (ONGOING) and the rate to 7.
 6. LOAD the setup and press T to bring up the test window.
-

2. **You may now practice using the standard overlay with the new scanning method: regular scan (ongoing).** The method will be the same as regular scanning, except that after you make a selection

from the array, the array automatically reappears and the cursor begins scanning again. If no character is selected, or if RETURN is selected, the array will disappear until you press the switch again.

3. When you are finished exploring this method, go to the punctuation array and select E (for ESC), or press ESC on the keyboard, to exit test mode.

Using Step Scanning

As an input method, step scanning requires more switch closures than regular scanning but may offer easier, more direct control for some users. To try out step scanning:

1. Go back to the Choices window, change the method in your setup to STEP SCAN and the rate to 6, then load the setup. The steps are:

-
1. Return to the Choices window (press ESC).
 2. Select MAKE CHANGES IN SETUP ... METHOD/RATE.
 3. Set the method to STEP SCAN and the rate to 6.
 4. LOAD the setup and press T to bring up the test window.
-

Before you try out the revised setup, it is important to know that **rate in step scanning is different from rate in regular scanning.**

In step scanning, you press the switch repeatedly for the cursor to advance group by group or item by item. When the cursor is on the group or item you want, you release the switch and wait. This means that the speed of cursor movement is always controlled by how you release and press the switch.

The rate in step scanning determines how long the AFC will wait, after you release the switch, before it assumes that the group or item under the cursor is the one you want.

The higher the rate, the more quickly the AFC responds when you release the switch. One means a very slow response (long wait); 29 is a quick response (almost no wait). You set the rate in this setup to 6.

2. You may now practice step scanning. The **overlay** is the same as the one you used in regular scanning, but the **method** for selecting characters is very different:

When you press the switch (or the APPLE key), the scanning overlay will appear at the bottom of the screen. When you release the switch, however, you should be planning to press it down again. In step scanning, you do not watch a cursor that moves by itself. Instead, you **press the switch repeatedly to move the cursor across the array.** (Each press of the switch moves the cursor one step.) To make a selection, **move the cursor until it is on the group or item you want, then release the switch and wait.**

For more information, read about step scanning in "What Is Scanning ... Scanning Methods," in the first part of this chapter.

3. **Experiment with pressing the switch very slowly and pressing it very quickly.** This will give you a feel for the importance of the rate (acceptance time) in step scanning.

If you press the switch slowly (so that the rate of 6 is too fast for you), you will find groups or items being selected that you didn't want. You would then want to set a slower rate, such as 4.

If you press the switch very quickly (so that the rate of 6 is too slow for you), you will find yourself waiting a relatively long time for the group or item you wanted to be selected. You would then want to set a faster rate, such as 7 or 8.

4. **Try selecting special functions and branching commands from the overlay.**

You will see that this overlay is the same as the one you used in regular scanning. It has the same special functions and commands.

5. **When done, select or press ESC to exit test mode.**

To practice step scanning with the other standard overlay, repeat this section and select the other setup (ETA or ABC).

Using Inverse Scanning

Using inverse scanning is similar to using a one-way joystick: hold or step to go, release to stop. It can also be used with two switches: switch #1 to move or step through the choices, switch #2 to select.

1. **Change the method in your setup to INVERSE SCANNING.**
The steps are:

-
1. Return to the Choices window (press ESC).
 2. Select MAKE CHANGES IN SETUP ... METHOD/RATE.
 3. Set the method to INVERSE SCAN and the rate to 6.
 4. LOAD the setup and press T to bring up the test window.
-

Rate in inverse scanning controls cursor speed and acceptance time.

In inverse scanning, you hold switch #1 closed (or press it repeatedly) for the cursor to advance group by group or item by item. To make a selection, wait until the cursor is on the group or item you want, then (1) release switch #1 and wait a set period of time (listen for the acceptance tone) OR (2) release switch #1 and press switch #2.

The rate in inverse scanning determines how quickly the cursor moves across the array (when you hold switch #1 closed) and how long the AFC will wait, after you release the switch, before it assumes that the group or item under the cursor is the one you want.

The higher the rate, the more quickly the cursor moves and the more quickly the AFC responds when you release the switch. One means a very slow cursor speed and a long wait as the acceptance time; 29 is a very fast cursor speed and a quick (short) response time. You set the rate in this setup to 6.

2. You may now practice inverse scanning. The **overlay** is the same as what you used in regular and step scanning, but the **method** is different:

You can use one or two switches. When you press switch #1 (or OPEN-APPLE), the scanning array will appear at the bottom of the screen. Once the array appears, your use of the switch is the opposite, or inverse, of regular scanning. In inverse scanning, **while you hold the switch closed, the cursor will begin moving across the array.** How quickly the cursor moves through the array will depend on the scanning rate you selected.

To make a selection, **wait until the cursor is on the group or item you want, then (1) release switch #1 and wait a set period of time (listen for the acceptance tone) OR (2) release switch #1 and press switch #2.**

3. **Experiment with switch control strategies:**

If holding the switch closed long enough and releasing it at the right moment are difficult, two strategies may be helpful. See the section on inverse scanning in "What Is Scanning ... Scanning Methods," in the first part of this chapter.

4. **Try selecting special functions and branching commands from the overlay.**

This is the same standard overlay as in the other scanning methods. It has the same special functions and commands.

5. **When done, select or press ESC to exit the test mode.**

To practice inverse scanning with the other standard overlay, repeat this section and select the other setup (ETA or ABC).

Using a Scanning Setup with Application Software

You have been practicing the scanning methods and standard overlays with the AFC test window. To practice scanning with application software, you

could try Text Demo or Lemonade Stand on your Sample Application Software disk, or any software of your own choosing.

To use application software with any setup:

1. Select and LOAD the setup.
2. When the SETUP IN EFFECT window appears, remove the AFC Menu Disk and put in your application disk. Then press RETURN (or select RETURN from the scanning array).

The application disk will boot, and you can use the AFC setup to run your application program. (See the preceding tutorial or Figure 12-4 for any special characters or functions.)

Using the Scan Big Setups

AFC System Software 4.0 includes the option to enlarge the characters in your scanning array to 20-column (1/2-inch) size, provided the application program uses full-screen graphics. Enlarging the characters in the S.Scan and T.Scan setups is not useful, however, because the arrays are too long — only the first 20 characters of each array would appear on the screen.

If you want a scanning array which can be large-sized and which includes all the keys on the Apple keyboard, try the S.ScanBig or T.ScanBig setup on your Extended Menu). The overlay is modelled on the standard ABC overlay, but the arrays are rearranged as five arrays with 20 characters each. If you load this setup and try it out with the AFC test window, the characters will not be large. But the characters will be large if you use the setup with an application program using full-screen graphics, such as Talking Text Writer (Scholastic), Dr. Peet's Talk/Writer (Hartley), or the 20- or 40-column version of Magic Slate (Sunburst).

Changing the Size or Position of the Scanning Array

You can change the size of the characters in the scanning array by using the AFC special option of SCAN SIZE. You can change the location of the scanning array on the screen with the special option of SCAN LINE.

To experiment with SCAN SIZE and SCAN LINE while using an application program, use CONTROL-A 2, described in Chapter 4.

With SCAN SIZE, 0 = normal-size text, 1 = medium scan characters, and 2 = large scanning characters (20-column size). The array will appear in large text only if the application program uses full-screen graphics.

With SCAN LINE, 0 = the top line of the computer screen, 1 = the second line, 2 = the third line, etc., with numbers continuing to 23 = bottom line. (The usual SCAN LINE = 22, the second-to-bottom line.)

When you use CONTROL-A 2 to change these settings, the change is saved only on the copy of the setup that is on the AFC. To save these changes on the Extended Menu, use CONTROL-A 3. (See Chapter 4.)

You can also make changes in special options from the Extended Menu: use the Make Changes window, and select special options. (See Chapter 6.)

Short Cuts for Advanced Users

Selecting setups from the Extended Menu is useful for a beginner, but a quicker way is to use the Quick-Start Menu which appears immediately when you turn on the computer, provided the AFC is turned ON. If the setup you want is on the Quick-Start Menu, you can select the setup from there — without using the Menu Disk at all.

For more information about quickly loading a setup or quickly changing method/rate, see "Short Cuts for Advanced Users" in Chapter 6.

Having Your Setup Active at Startup

The AFC is shipped from the factory with a setup called "Normal" in the #1 position — this means only the Apple keyboard, *not* scanning, is active at startup. To have your method active at startup, all you need to do is move your preferred setup to the #1 position on the Extended Menu, above the double-dotted line.

For instructions, see "Having Your Setup Active at Startup" in Chapter 6.

CREATING YOUR OWN SETUPS

So far, you have tried out the different scanning methods with the standard overlays in the "S.Scan" or "T.Scan" setups. If and when the existing setups do not meet your needs, we recommend that you move beyond the factory-made setups (which are for general use) and create your own setups (for specific use). Your own setup can have a standard, redefined, or customized overlay.

Chapter 7, REFERENCE: ADDING A SETUP, describes the process of planning a setup and gives specific information about the first step — learning the application software.

Please read the first part of Chapter 7 – "Planning the Setup" and "Learn the Application Software" – up to the line of stars (***). When you reach the stars, return here for details about planning and creating a scanning overlay.

Designing a Scanning Overlay

Once you are familiar with your application program, such as Alex the Rabbit, you can begin designing the specifics of your overlay. We'll describe each step, using Alex the Rabbit as an example, but the information will help you design or edit any type of scanning overlay.

Remember that designing and creating an overlay may be done by a person who uses the computer keyboard or by a person who uses any AFC method with a full-access overlay. Thus if you are an independent AFC scanner, you can create your own setups and overlays, *provided* you have your full-access scanning setup in the #1 position on the Extended Menu, above the double-dotted line. (See "Having Your Setup Active at Startup, Chapter 6.")

The steps are:

- choose the keys you want to include in this overlay
- decide how many arrays are needed
- choose the width of the scan line (40 regular or 20 large characters)
- plan the following for each array:
 - LAYOUT (group-item or one-at-a-time pattern; segment length)
 - USER SEES (characters shown on the array)

- COMPUTER RECEIVES (characters sent to the computer when an item is selected)

For a talking scanner, additional steps for each array are:

- choose what the USER HEARS when the cursor is on a group or item
- decide whether and how to use the optional speech (SPEECH FEEDBACK) after an item is selected

CHOOSING THE KEYS

Consider what you know about the abilities of the user with scanning, the goals of the computer activity, and the requirements of the application software. From this, **decide what keys or key combinations you want in the overlay**. The keys you choose could be the entire list you wrote down when reviewing the software or a modification of that list, since you may not be planning to use all the keys required in the application software. Make a list of the keys or key combinations you want to include.

For example, you might be creating an overlay for Alex the Rabbit for a person who can use an array of four items but has difficulty with five or six. If the goal of the activity is to improve concepts of spatial relations, you would not want to make the motor task, the scanning itself, too difficult. So you would probably choose to limit your array to four items: the four ARROW keys.

If, on the other hand, this user works easily with an array of five items, you might choose to have five items on your array: the four ARROW keys plus one other. You might choose RETURN as the fifth key, to allow the user to start the game. Selecting RETURN during the game will make Alex wiggle his ears.

In our example, let's assume the chosen keys are:

UP ARROW DOWN ARROW LEFT ARROW RIGHT ARROW

HOW MANY ARRAYS?

In a scanning overlay, you may have as many as 10 interbranching arrays. The standard ABC and ETA overlays, for example, each have three arrays – for alphabet, numbers, and punctuation. The number of arrays you choose will depend on the abilities of the user with scanning, the goals of the computer activity, and the number of keys you selected above.

In our example, let's say we want our Alex the Rabbit overlay to consist of one array with four items. (We could also create it as four arrays, each with one item, with automatic branching from one array to the next, giving the effect of rotating words or arrows, but let's save that for a later discussion.)

WIDTH OF SCAN LINE

The WIDTH of your scan line is the number of columns, characters, or spaces that fits across the computer screen. If the overlay the user sees will be the usual 1/4-inch computer characters, the WIDTH of your scan line will be **40 columns**, because the computer allows you to fit as many as 40 regular-sized characters on one line.

If you are planning to use large size characters, however, the width of the scan line is **20 columns**. The large scanning characters take up twice as much room as the regular-size text, so you can only fit 20 characters, rather than 40, on one scan line.

In our example, we'll plan on regular-size characters: the width of the scan line will be 40 columns.

PLANNING THE LAYOUT AND USER SEES

For each array in your overlay, you must decide:

- Will the scanning pattern be one-at-a-time or group item?
- What characters will the user see on the array?
- What will be the length of the segments in the array?
- What characters will the user see in each segment?

Deciding the scanning pattern (one-at-a-time or group-item) will depend on the abilities of the user with scanning, the goals of the computer activity, and the number of items you have selected to be in each array.

In our example (one array with four items), a group-item pattern would not make much sense, so let's decide on a one-at-a-time pattern.

The characters the user sees in the array may be any of the characters available from the computer keyboard. In a group-item pattern, each item must be a single character. In a one-at-a-time pattern, however, whole words may be used as items.

In Alex the Rabbit, we had decided the items in the array would be the four ARROW keys. The characters we show in the array could be symbols, such as `^ V < >`, or letters, such as `U D L R`, or whole words, such as `UP DOWN LEFT RIGHT`. In our example, let's say we'd like to use whole words.

SEGMENT LENGTH refers to the number of spaces under the cursor when the cursor moves across the array. The smallest possible segment length is one space. The largest possible segment length is the width of the screen — forty regular or twenty large spaces.

With regular-size scanning, you could have anywhere from 40 segments of one space each to 1 segment of 40 spaces. With large-size scanning, you could have from 20 segments of one space each to 1 segment of 20 spaces.

To decide on segment length, think about how many segments you want in the array, how many characters you want in each segment, how widely spaced you want the items, and how large you want the cursor to be. Work out on paper which segment length will best meet your needs. (Graph paper can be useful.) You may need to make some revisions in the characters you want to display, especially if these are whole words.

In our example, we only need four words: `UP DOWN LEFT RIGHT`. That's a total of 15 letters (so our 40-character limit is no problem) and the longest word is five letters (so a segment length of seven would give an extra space on each side). If we

choose a segment length of seven, our array would look like this:

|_ _UP_ _ _| DOWN_ _ _| LEFT_ _ _| RIGHT_ _ _|

The 28 spaces needed (4 segments of 7 spaces each) will fit into our 40-character scan width. If we were planning to use large-sized scanning, the scan width is limited to 20 spaces, so we'd need to use a smaller segment length.

When the cursor moves across these items, it will fill up the entire seven spaces in each segment.

MAKING A SCANNING OVERLAY WORKSHEET

After you have decided the LAYOUT and USER SEES, you will need to decide the following:

For a non-talking scan:

COMPUTER RECEIVES

For a talking scan:

USER HEARS

COMPUTER RECEIVES

SPEECH FEEDBACK (optional)

If the scan is not a talking scan, then you only need to decide what the **COMPUTER RECEIVES** when an item is selected. This means deciding what character or characters the AFC is to send to the computer for each item on the array.

For a talking scan, you must, in addition, decide what the **USER HEARS** — what the speech synthesizer speaks when the cursor is on a group or item. With a talking scan you also have the option of **SPEECH FEEDBACK** — having the speech synthesizer speak something after an item is selected.

A good way to lay this out is to make a **Scanning Overlay Worksheet**, as shown in Figure 12-5.

The main idea of a scanning Overlay Worksheet is to allow you to plan each array in your overlay prior to creating the overlay on the disk. In Figure 12-5, the top section outlines information which will be part of creating the overlay on disk and shows how the array will look to the user (in a box). The middle part of the worksheet has columns which further define each item in the array. Finally, at the bottom of the worksheet are questions which pertain to final construction of the overlay on disk.

Figure 12-5. Scanning Overlay Worksheet for Alex the Rabbit

Name of Program: **Alex the Rabbit (by Apple)**

Name of Setup: **Alex Up**

Array #: **1 of 1** Width: **40** Pattern: **One-at-a-time** Segment Length: **7**

__UP__		DOWN__		LEFT__		RIGHT__		_____		_____
--------	--	--------	--	--------	--	---------	--	-------	--	-------

USER SEES	USER HEARS (optional)	COMPUTER RECEIVES	SPEECH FEED- BACK (optional)	RESULT in Application
UP	Up	UP ARROW	"Go up, Alex"	Alex moves up
DOWN	Down	DOWN ARROW		Alex moves down
LEFT	Left	LEFT ARROW	"Move to the left"	Alex moves left
RIGHT	Right	RIGHT ARROW		Alex moves right

WHAT NEXT:

- **AFTER SELECTION:** If this overlay has more than one array, which array should be next after a selection is made from this array? **does not apply**
- **IF NO SELECTION:** What should happen next if the user does not select any of the items in this array? **start over**

The top part of Figure 12-5 show the decisions we have made so far: the number of arrays, width, pattern, segment length, and what the array will look like. The USER SEES column lists each item the user will see on the array.

CHOOSING WHAT THE USER HEARS (optional)

If you are creating a talking scanner, what do you want the speech synthesizer to say when the cursor is on a group or item? Write this down for each group and each item. You needn't worry at this point how the speech will sound — just write down what you think you want it to say. Once you are creating the overlay on disk, you will be able to hear what the speech sounds like.

The USER HEARS column in Figure 12-5 shows what we want the user to hear for each item in our example overlay. What the USER SEES and what the USER HEARS don't have to be the same, although they are the same in this example.

CHOOSING WHAT THE COMPUTER RECEIVES

Once you've listed what the USER SEES and (optional) HEARS, you're ready to fill in what the computer will receive. Using the original list of keyboard characters you wanted to include in the overlay, fill in the COMPUTER RECEIVES column with the exact character or characters you want the AFC to send to the computer when each item is selected.

CAUTION: The important factor here is that the application program do what you want it to do when that item is selected — the COMPUTER RECEIVES for each item must be the character or sequence of characters required by the application program to produce the RESULT you desire. The columns in Figure 12-5 show what the USER SEES and the COMPUTER RECEIVES for each item plus the RESULT we are expecting in the application program.

Sometimes, what the USER SEES is exactly the same as what you want the COMPUTER TO RECEIVE, but in some applications these are not the same.

In our overlay for Alex the Rabbit, the user sees the words UP DOWN LEFT RIGHT in the array, but when any of those

words is selected, we want an ARROW key to be sent to the computer, not the letters UP or DOWN, etc. This is because the program, Alex the Rabbit, **requires the ARROW keys** to make Alex go up, down, left, or right. (If you type the letters UP, Alex just wiggles his ears and the program prints "Alex doesn't understand you.") So, for each of the items in the array, we have listed the appropriate ARROW key under COMPUTER RECEIVES and the corresponding RESULT we expect in the program when that item is selected.

In our Alex the Rabbit example, each item on the array only sends **one character** to the computer, because that is all we need in this application. Remember, however, that one item in the array could send **a string** of up to 100 characters as well.

CHOOSING THE SPEECH FEEDBACK (optional)

With a talking scanner, when and what the speech synthesizer "speaks" may be defined in two ways. These are:

USER HEARS: what the user hears **as the cursor moves** across the array

SPEECH FEEDBACK: what the user hears **after an item is selected**

If you are creating a talking scanner, you must define what the USER HEARS as the scanner moves across the array. SPEECH FEEDBACK, on the other hand, is an option which you may or may not want to use in your application.

Notice in the SPEECH FEEDBACK column of Figure 12-5 that, as an experiment, we are planning on speech feedback for just the UP- and LEFT-ARROWS . When we create and use this array, this will allow you to evaluate whether you prefer speech feedback in this application or not.

WHAT NEXT?: WHAT TO DO AFTER A SELECTION IS MADE OR IF NO SELECTION IS MADE?

Two more questions remain at the bottom of the Scanning Overlay Worksheet shown in Figure 12-5. These pertain to WHAT NEXT? — what the scanner should do after a selection is made from the array or if no selection is made.

- **AFTER SELECTION:** If this overlay has more than one array, which array should be next after a selection is made from this array?

This question applies only if you are creating an overlay with more than one array. (If you are designing an overlay with more than one array, read about BRANCHING, below.)

In the example of Alex, we are creating only one array. So this question does not apply.

- **IF NO SELECTION:** What should happen next if the user does not select any of the items in this array.

Visualize for a moment — the cursor moves across the array, but you haven't made a selection. When the cursor has gone off the end of the array and no selection has been made, what do you want the scanner to do?

Quit

The array disappears until you press the switch again. This would be important in an application where the array covers up a line of text.

Start over

The array stays and the cursor starts over. This might be useful in a training situation, where the user is just learning to scan.

Note: If you are planning to use a custom overlay with reg.scan (ongoing), where the array stays on the screen after a selection is made, do not choose "Start over," because that is already in the scanning method. Instead, choose "Quit."

**Branch to
another array**

This applies only if this overlay has more than one array. (See BRANCHING, below.)

In our Alex example, we probably want the scanner to start over if no selection is made, so we would use "Start over."

DESIGNING OVERLAYS WITH MORE THAN ONE ARRAY (BRANCHING)

This section discusses BRANCHING. Branching is important only if you are designing an overlay with more than one array. For example, an overlay for Alex could have four arrays with one item each, giving the effect of rotating words or arrows. If you are reading this chapter for the first time, feel free to skip ahead to "Creating the Setup on Disk," so that you can create and use the overlay we have designed so far. Then, at a later time, come back to this section to read about designing an overlay with branching arrays.

In some applications, you may design an overlay which has more items than can fit or be easily used in one array. You may create as many as ten arrays within one overlay.

When you have more than one array in an overlay, you must plan how the movement from one array to another will occur. BRANCHING means moving from one array to another. Three methods of branching are available in AFC scanning.

**Branching
method #1:** **Make one of the items in an array consist of
or include a special AFC BRANCH TO character.**

In the standard ABC and ETA overlays, the "#" (number sign) in the alphabet array takes you to the numbers array and the "." (period) in the first group of the alphabet and numbers arrays takes you to the punctuation array. What the USER SEES are the ordinary "#" and "." symbols, but what the COMPUTER RECEIVES when one of those items is selected is a special BRANCH TO character.

USER SEES

COMPUTER RECEIVES

#

<BRANCH TO> 2 (branches to Array #2, numbers)

.

<BRANCH TO> 3 (branches to Array #3, punctuation)

The **BRANCH TO** character can also be placed at the end of **COMPUTER RECEIVES** for an item. This is useful when, for one **USER SEES** item, you want to send certain characters to the computer, then branch to another array.

For example, your application software may have a main menu of several programs which could use different scanning arrays for best operation. In this case, your first array could represent the choices on the program's main menu. Each item on this array could send the characters needed to select a particular program, then branch to the appropriate array for running that program.

How to put the **BRANCH TO** character in an array will be discussed under "Creating the Setup on Disk ... Multiple Arrays (Branching)."

Branching method #2: Specify that **AFTER SELECTION** of any item from a particular array, a different array will come next.

This refers to the question shown near the bottom of the Scanning Overlay Worksheet: **If this overlay has more than one array, which array should be next after a selection is made from this array?** You may choose to have the same array reappear, or a different array.

If you use this branching method for an array, branching occurs automatically after any selection is made from that array.

Figure 12-6 describes an overlay with two arrays, designed for Story Machine™, published by Spinnaker for the Apple II+ and IIe. Array #1 displays the words **BOY GIRL DOG**, and array #2 displays the words **WALKS SINGS JUMPS**. This overlay has been designed so that **BOY GIRL DOG** remains on the screen until a selection is made. Once a selection is made from that array, it disappears, and **WALKS SINGS JUMPS** will appear the next time you press the switch. The second array will stay on the screen until a selection is made. Once a selection is made from array #2, it disappears, and array #1 will reappear the next time you press the switch. (Unfortunately, Story

Machine does not work in the Apple IIGS computer. This particular branching example works only in an Apple IIe.)

Figure 12-6. An Example of Branching After a Selection Is Made

Name of Program: Story Machine (by Spinnaker)

How many arrays in this overlay: 2

Array #1:	One-at-a-time	Segment Length: 6	
USER SEES:	BOY	GIRL	DOG
COMPUTER RECEIVES:	THE BOY SPACE	THE GIRL SPACE	THE DOG SPACE

Array #2	One-at-a-time	Segment Length: 7	
USER SEES:	WALKS	SINGS	JUMPS
COMPUTER RECEIVES:	WALKS.RETURN	SINGS.RETURN	JUMPS.RETURN

For Array #1: AFTER SELECTION: Next array = Array #2
IF NO SELECTION: Start over

For Array #2: AFTER SELECTION: Next array = Array #1
IF NO SELECTION: Start over

Branching method #3: Specify that IF NO SELECTION is made from a particular array, a different array will appear.

This refers to the second question shown at the bottom of the Scanning Overlay Worksheet: **What should happen next if the user does not select any of the items in this array?** You may choose to have the same array reappear (quit scanning or start over) or to have the scanner branch to a different array.

This branching method is, in effect, a way to extend an array, so that the cursor seems to go off the right side of the screen, then continue at the left side of a new array.

For example, the Scan Large setup contains five arrays, modelled on the three arrays in the standard ABC overlay. Since the width of a large-size scanning line is 20 characters, the alphabet and punctuation arrays are really two arrays of 20 characters each. If you don't make a selection from the first array, the second array automatically appears.

The IF NO SELECTION method may also be used to make a "circle" of arrays, such as, $1 \rightarrow 2 \rightarrow 3 \rightarrow 1$. This can be especially effective when each array in the circle contains just one item. Figure 12-7 describes how this branching method was used to create the ROTATING > setup on your Menu Disk.

Figure 12-7. Rotating Arrows for Alex the Rabbit

Name of Program: Alex the Rabbit (by Apple)

Name of Setup: ROTATING >

How many arrays in this overlay: 4

Array #1: One-at-a-time Segment length: 3

USER SEES: ^ (type SHIFT-6)

COMPUTER RECEIVES: UP ARROW

AFTER SELECTION: Next array = Array #1

IF NO SELECTION: Branch to Array #2

Array #2: One-at-a-time Segment length: 3

USER SEES: > (type the "greater than" symbol)

COMPUTER RECEIVES: RIGHT ARROW

AFTER SELECTION: Next array = Array #1

IF NO SELECTION: Branch to Array #3

Array #3: One-at-a-time Segment length: 3

USER SEES: V (type capital V)

COMPUTER RECEIVES: DOWN ARROW

AFTER SELECTION: Next array = Array #1

IF NO SELECTION: Branch to Array #4

Array #4: One-at-a-time Segment length: 3

USER SEES: < (type the "lesser than" symbol)

COMPUTER RECEIVES: LEFT ARROW

AFTER SELECTION: Next array = Array #1

IF NO SELECTION: Branch to Array #1

Creating the Setup on Disk

Before creating a setup on disk, it's helpful to have a quick overview of the process:

Extended Menu	→ Construction Programs	→ Extended Menu
(ADD A SETUP)	(CREATE, SAVE, QUIT)	(LOAD and use setup)

First you select ADD A SETUP from the bottom of the Extended Menu. This takes you to the setup Constructions Programs — you select a method and create an overlay. When done, you SAVE the setup on disk, then QUIT. Selecting QUIT takes you back to the Extended Menu, where you can LOAD the setup in the usual way and use it with an application.

The overlay you select for the setup can be the standard ABC or ETA overlay, a modification of the standard overlay, or a customized overlay that you create "from scratch." This section assumes you have already planned your own overlay (see preceding pages) and are ready to create it on disk. Small italicized instructions are a continuation of the tutorial for the ALEX UP setup (see Figure 12-5).

You can use any Apple II computer, even if it does not have an AFC installed. You cannot test the overlay, however, if the computer does not have an AFC.

EXTENDED MENU OF AFC SETUPS

.....
.....
.....
.....

ADD A NEW SETUP

DELETE/COPY/REARRANGE
SIMPLIFY/EXPAND
OTHER OPTIONS
QUIT

1. Boot the Menu Disk.

**Press '9' (or use
SPACEBAR or ARROWS) to
move the cursor to
ADD A NEW SETUP.**

Press RETURN.

AFC CONSTRUCTION PROGRAMS

CREATE A NEW SETUP WHICH USES:

- 1: EXPANDED OR MINIATURE KEYBOARD
- 2: SCANNING
- 3: MORSE CODE
- 4: ASSISTED APPLE KEYBOARD
- 5: MULTIPLE SWITCH BOX
- 6: ASCII INPUT
- 7: NORMAL INPUT

PLEASE INDICATE CHOICE AND PRESS RETURN
PRESS ESC TO RETURN TO EXTENDED MENU

2. A menu will appear, listing the AFC input methods.

Move the cursor to SCANNING; press RETURN.

PLEASE ENTER A TITLE FOR THE NEW SETUP:

==> -----

(ENTER A TITLE IN THE SPACE ABOVE;
PRESS RETURN)

3. You will be asked to enter a title for the new setup. The limit is 10 characters.

Enter a title; press RETURN. If you don't enter a title, the setup will be given the title NONAME.

For the Alex tutorial, enter the title from the worksheet: Alex Up.

If you later want to change the title, select MAKE CHANGES IN SETUP from the Choices window, then select DESCRIPTION. The title of a setup is part of the Description.

THE OVERLAY WILL BE:

- 1: CUSTOMIZED (you create completely)
- 2: STANDARD (same as standard overlay)
- 3: REDEFINED STANDARD (you modify)

(INDICATE CHOICE AND PRESS RETURN)

4. A listing and description of overlays will appear.

- To create a setup with the **standard ABC or ETA overlay**, select 2: STANDARD. You will then be asked if you want the ABC or ETA arrangement. You can later make changes in the overlay by means of the Make Changes window.
- To create a setup with a **redefined standard overlay**, select 3: REDEFINED STANDARD. The standard overlay you request will be loaded and you can immediately redefine it as desired.
- To create an overlay **not based on the standard overlay**, select 1: CUSTOMIZED.

For Alex, our overlay is NOT based on a standard scanning overlay. We want to create it completely from scratch. Move the cursor to CUSTOMIZED; press RETURN.

If you select STANDARD, skip ahead to step 19, "Saving Your Work," below.

If you select REDEFINED, skip ahead to step 6, below.

If you select CUSTOMIZED, continue reading.

PLEASE SPECIFY SPEECH-FEEDBACK OPTION:

- 1: NONE
- 2: ECHO SPEECH SYNTHESIZER
- 3: EXTERNAL SYNTHESIZER

(INDICATE CHOICE AND PRESS RETURN)

5. A speech-feedback choice appears.

If you select NONE, you cannot later add speech feedback to this setup. If you select a synthesizer, this setup will be equipped for speech feedback, which you can turn off later, if you choose.

NOTE: A setup which includes speech feedback takes up 3-4 times as much memory on the AFC as setup which does not include speech feedback. This influences how many setups fit on the Quick-Start Menu.

For Alex, we will begin by NOT using speech feedback (we'll use it later) — move the cursor to NONE; press RETURN.

SCAN-CREATE

This program will allow you to create an overlay for use with scanning. It may contain up to 10 scanning arrays.

How many scanning arrays do you want to include in this new overlay?

==>

Please enter a number from 1 to 10 and press RETURN.

6. The SCAN-CREATE program begins by asking how many arrays you want to include in this overlay. The maximum number is 10.

Enter the number of arrays you want, then press RETURN.

For Alex, press the number 1, then RETURN.

20-COLUMN OPTION:

Please select width of scan line:

☐ 40-COLUMNS

☐ 20-COLUMNS

Select the 20-column width if you plan to use the LARGE-SCAN option. Note that this option only works with full-screen-graphics programs.

7. The next screen presents the 20-COLUMN OPTION.

In most cases, you will want the full 40 columns as the width of your scanning line. For information about the 20-column option, see "Large-Size Arrays," later in this chapter.

Move the cursor to the width you want, then press RETURN.

For this tutorial, select 40-COLUMNS.

SCAN-CREATE: MAIN MENU

Please select:

- 1 - WORK WITH AN ARRAY
- 2 - TEST/SAVE/QUIT
- 3 - OTHER OPTIONS

Use arrows plus RETURN to select

8. The Scan-Create Main Menu appears.

To begin creating, press RETURN when the cursor is on WORK WITH AN ARRAY.

Array #1

Each of the following features of this array must be specified:

- 1 - LAYOUT
- 2 - USER SEES
- 3 - COMPUTER RECEIVES
- 4 - WHAT NEXT?
- 5 - DONE

-
- * Press RETURN to work on the feature indicated by the cursor, or
 - * Use arrows to select a different one

9. A "work menu" appears for array #1. The menu lists the essential decisions for a scanning array.

If you've been following the Alex tutorial, you have already made these decisions on paper — we just need to create the array on disk.

When creating an array, it's best to use the menu items in order. If you later edit the array, you can edit parts in any order.

The first step is LAYOUT. When the cursor is on LAYOUT, press RETURN.

LAYOUT

Array # 1 -- LAYOUT:

SCANNING PATTERN = ONE-AT-A-TIME
SEGMENT LENGTH = 7

These settings will determine how the
scanning cursor moves through the array.

Please select:

CHANGE SCANNING PATTERN
CHANGE SEGMENT LENGTH

Use arrows plus RETURN to select

10. LAYOUT consists of the scanning pattern (one-at-a-time or group-item) and segment length (1-40). Default settings are shown at the top of the screen.

To get more information or to change the scanning pattern or segment length, move the cursor to the appropriate line and press RETURN. If both are correct, select OK AS SHOWN.

For the Alex tutorial, we want the one-at-a-time scanning pattern and a segment length of 7. Feel free to explore "Change scanning pattern" or "Change segment length." Be sure the top of the screen shows "scanning pattern = one-at-a-time, segment length = 7" before you select OK AS SHOWN.

Array #1

- - - - -

Each of the following features of this
array must be specified:

1 - LAYOUT

3 - COMPUTER RECEIVES
4 - WHAT NEXT?
5 - DONE

11. The work menu reappears, with the cursor on the next step, USER SEES.

Press RETURN.

USER SEES

Array #1 -- USER SEES



Please enter the scanning array on the line above, as the user will see it.

Use these commands to edit your work:

<ARROWS> = move cursor
<DELETE> = erase one character
<CTRL-X> = clear entire line
<RETURN> = done

12. The USER SEES page appears.

Enter the characters as you want them to be seen on the scanning array.

Each '-' on the screen indicates the beginning of a new scan segment.

Use SPACEBAR to create spaces, DELETE to delete one character, ARROWS to move the cursor as needed, CONTROL-X to clear the entire line, or CONTROL-Y to clear from the cursor on.

For the Alex tutorial, enter the letters for UP DOWN LEFT RIGHT with spacing as shown in Figure 12-5. Each word must be in its own scan segment. In Figure 12-5, the first '-' after a vertical line is the beginning of a scan segment; press SPACEBAR for each '-' mark.

When done with USER SEES, press RETURN.

Array #1

_ UP _DOWN_ LEFT _RIGHT _

Each of the following features of this array must be specified:

1 - LAYOUT
2 - USER SEES
3 - COMPUTER RECEIVES
4 - WHAT NEXT?
5 - DONE

13. The work menu reappears, with the cursor on the next step, COMPUTER RECEIVES.

Press RETURN.

COMPUTER RECEIVES

Array #1 -- COMPUTER RECEIVES

DOWN LEFT _RIGHT_ _

When the user selects this item,
the computer will receive:

Use right & left arrows to move cursor
or use up & down arrows + RETURN to:

GO TO NEXT STEP

14. The COMPUTER
RECEIVES page appears.

The User Sees line will be
near the top of the screen,
with the first item high-
lighted by the cursor.

You are to enter the
character(s) you want the
computer to receive when
the user selects the high-
lighted item. Please
read below.

COMPUTER RECEIVES is the character or characters which will go to the
computer when an item on the scanning array is selected.

The procedure for entering COMPUTER RECEIVES is usually straightforward:

- (1) Use **RIGHT** and **LEFT ARROWS** to move the cursor to a
specific item on the array; press **RETURN** to **MODIFY**
COMPUTER RECEIVES for that item.
- (2) Enter the characters you want the computer to receive
when that item is selected; press **RETURN**.

If you want the computer to receive the letter 'A,' just press A,
then press RETURN. If you want the computer to receive the
word "COMPUTER," enter the letters C O M P U T E R, then
press RETURN.

Special considerations are upper- versus lower-case characters and using
special characters, such as LEFT ARROW, RETURN, ESC, or CONTROL or
NUMERIC KEYPAD characters. These are discussed below.

*For the Alex tutorial, continue reading for background information.
Specific instructions will follow.*

Upper versus Lower Case

1. **If your application software requires upper-case letters** (such as "A" and not "a" — this is frequently true of educational software), **be sure to enter the COMPUTER RECEIVES characters in upper case** ("A"). When you later use this overlay, the characters sent to the computer will then be in upper case, regardless of whether the AFC CAPS-LOCK function is on or off.
2. **If your application software accepts both upper-case and lower-case letters** (such as a word processor), **enter the COMPUTER RECEIVES characters in the upper- or lower-case desired** (such as "Saturday"). When you later use this overlay, COMPUTER RECEIVES ("Saturday") will be sent as you entered it, provided the AFC CAPS-LOCK function has been toggled off. If the AFC CAPS-LOCK function is on, the characters will be sent in all upper case ("SATURDAY").
3. **If you are programming an overlay with single letters** (rather than words), **you need not worry about upper- versus lower-case**. Single letters in a customized overlay will be sent to the computer as upper case ("A") if AFC CAPS LOCK is on and as lower case ("a") if AFC CAPS LOCK is off.

More information on AFC CAPS LOCK is available in the "Using ..." section, earlier in this chapter.

Special Characters

To place special characters, such as RETURN or LEFT ARROW, in COMPUTER RECEIVES, use the special-character window:

Array #1 -- COMPUTER RECEIVES

Array _user _will _see _shows _here

When the user selects this item,
the computer will receive:

☐

INSERT SPECIAL CHARACTER
(USE ARROWS + RETURN)

<NONE>
<AFC.BRANCH TO>
<ESCAPE>
<RETURN>
<SPACE>
<LEFT ARROW>
<RIGHT ARROW>
<UP ARROW>
<DOWN ARROW>
<TAB>
<DELETE>
<CTRL-X>
<CTRL-Y>
<COMMAND/OPEN.APL>
<OPTION/SOLID.APL>
<CONTROL>
<CAPS-LOCK>
<SHIFT>
<NUM.KEYPAD>
<RESET>
<AFC.REPEAT>
<AFC.MACRO>
<AFC.MOUSE>
<AFC.NULL>

1. Press ESC.
2. The special-character window will appear. You can scroll through the window in the usual way, or you can press numbers (1-9) to move to various points along a special-character ruler. (9=end, 1= beginning, 3=1/3 down, etc.)
3. Move the cursor to the desired special character; press RETURN.

The name of that character (or an abbreviation) will be displayed in the COMPUTER RECEIVES line.

If a character is not in the special-character window, it is not really "special." To enter any character not in this window, simply press, send, or select that character in the usual way.

NOTE: SPACE, TAB, UP and DOWN ARROWS are not really special characters. They appear in the special-character window because many

people expect them to be there. You can enter them in COMPUTER RECEIVES by simply pressing those keys on the Apple keyboard.

When you select a special character or press SPACEBAR, TAB, UP or DOWN ARROW, the COMPUTER RECEIVES line will show the name of that character in <brackets>. The name and the < > are generated by the Scan-Create program to let you know you have entered that character into what the computer will receive. **Do not try to enter such characters by typing the name yourself and putting it in brackets** — while this will look the same on the screen, the COMPUTER RECEIVES will not work correctly with your application program.

The following instructions apply to entering the characters for COMPUTER RECEIVES for the Alex Up example.

1. To enter COMPUTER RECEIVES for the word UP:

(1) Make sure the cursor at the top of the screen is on the word UP.

(2) Make sure the cursor at the bottom of the screen is on MODIFY COMPUTER RECEIVES. Press RETURN.

A small cursor will appear in the middle of the screen. This is the COMPUTER RECEIVES line.

*(3) Press the UP-ARROW key on the Apple keyboard.
<UP ARROW> will appear on the COMPUTER RECEIVES line.*

This means that when the highlighted item UP is selected, the UP ARROW character will be sent to the computer.

(4) You are done with this COMPUTER RECEIVES entry, so press RETURN.

2. To enter COMPUTER RECEIVES for the word DOWN:

(1) Use RIGHT ARROW to move the top cursor to the word DOWN.

(2) The bottom cursor should still be on COMPUTER RECEIVES; press RETURN.

(3) Press the DOWN-ARROW key on the Apple keyboard. Press RETURN.

3. To enter COMPUTER RECEIVES for LEFT and RIGHT:

- (1) Move the top cursor to the item the user will select.
- (2) The bottom cursor should still be on **COMPUTER RECEIVES**; press **RETURN**.
- (3) **LEFT ARROW** and **RIGHT ARROW** are special characters. To enter a special character, press **ESC**. Move the cursor in the special-character window to the type of arrow you want, then press **RETURN**.
- (4) When the **COMPUTER RECEIVES** line is complete, press **RETURN** again.
- (5) Repeat this procedure for the remaining arrow.

For the Alex tutorial, you can now skip ahead to "Checking or Editing Computer Receives," below.

CONTROL-Characters

Most **CONTROL**-characters can be entered as-is by holding down the **CONTROL** key and pressing the associated character key. The exceptions are **CONTROL-X** and **CONTROL-Y**, which are available through the special-character window.

NUMERIC-KEYPAD Characters

To enter a numeric-keypad character, first enter the **NUM.KEYPAD** from the special-character window, then enter the character itself, such as 1, 2, +, -.

For the **ENTER** character, use the special-characters **NUM.KEYPAD + RETURN**.

For the **CLEAR** character, use the special-characters **NUM.KEYPAD + CTRL-X**.

CHECKING OR EDITING COMPUTER RECEIVES

COMPUTER RECEIVES is the most important part of your scanning array, because what the computer receives is what runs your application program.

15. To check or edit **COMPUTER RECEIVES**, start with the Computer Receives page for your array on the screen, as shown below.

Array #1 -- COMPUTER RECEIVES

_ UP _ DOWN _ LEFT **RIGHT** _

When the user selects this item,
the computer will receive:

<RIGHT ARROW>

Use right & left arrows to move cursor
or use up & down arrows + RETURN to:

MODIFY COMPUTER RECEIVES
GO TO NEXT STEP

To check the contents
of Computer Receives,
move the top cursor to
each item on the array
and check that the
Computer Receives line
shows exactly those
characters you want the
computer to receive
when that item is
selected.

*For Alex, Computer Receives
should be the name of each
appropriate arrow.*

To modify COMPUTER RECEIVES for any item, make sure the
bottom cursor is on MODIFY COMPUTER RECEIVES and press
RETURN. Use these commands to edit the characters in COMPUTER
RECEIVES:

ARROWS	to move the cursor within the entry
DELETE	to erase one character
CONTROL-X	to clear the entire entry
CONTROL-Y	to clear the entry from the cursor to the end
ESC	to insert special characters

When done editing the entry, press RETURN.

GO TO NEXT STEP

16. When done with Computer Receives for an array, move the bottom
cursor to GO TO NEXT STEP, then press RETURN.

WHAT NEXT?

Array #1

_ UP _DOWN_ LEFT _RIGHT_ _

- 1 - LAYOUT
- 2 - USER SEES
- 3 - COMPUTER RECEIVES
-
- 5 - DONE

17. The work menu appears, with the cursor on the next step, WHAT NEXT?

Press **RETURN**.

IF NO SELECTION

What should happen next if the user does not select any of the items in this array?

- 1 - QUIT SCANNING
-

Use arrows plus RETURN to select

A page titled
IF NO SELECTION
will appear. The question concerns what you want the scanner to do if the user does not make a selection from the array.

For a scanning overlay with just one array, the choices are two:

- **QUIT SCANNING** — the array disappears until you press the switch again. This would be important in an application where the array covers up a line of text.
- **START OVER** — the array stays and the cursor starts over. This might be useful in a training situation, where the user is just learning to scan.

Note: If you are planning to use reg.scan (ongoing), where the array stays on the screen after a selection is made, do not choose "Start over," because that is already in the method.

If an overlay has more than one array, a third choice will also appear:

- **BRANCH TO ANOTHER ARRAY** — then specify which array.

*For the Alex example, notice at the bottom of Figure 12-5 that we had decided to have the cursor **START OVER** if no selection were made from the array.*

Move the cursor to your choice and press RETURN.

DONE

Array #1

_ UP _ DOWN _ LEFT _ RIGHT _ _

1 - LAYOUT

2 - USER SEES

3 - COMPUTER RECEIVES

4 - WHAT NEXT?

5 - DONE

18. The work menu appears, with the cursor on the next step, **DONE**.

Press RETURN.

The Scan-Create Main Menu will appear.

SAVING YOUR WORK

19. You *must* save your work before turning off the computer, or it will all be lost. It is also a good idea to save your work fairly often (such as every 10 minutes), even if you are not ready to quit. To save the setup you are working on:

SCAN-CREATE: MAIN MENU

Please select:

1 - WORK WITH AN ARRAY

2 - TEST/SAVE/QUIT

3 - OTHER OPTIONS

Use arrows plus RETURN to select

Get the Scan-Create Main Menu on the screen.

(From the array work menu, just press ESC.)

Move the cursor to TEST/SAVE/QUIT; press RETURN.

For this tutorial, go ahead and select TEST/SAVE/QUIT.

TITLE: Sample

METHOD: REGULAR SCANNING

RATE: 5

PLEASE SELECT:

1 - TEST IT!

2 - CHANGE METHOD/RATE

3 - CONTINUE EDITING/CREATING

4 - SAVE TO DISK

5 - QUIT

You will see a screen with choices. The title, method, and rate for your setup appear at the top, followed by several choices.

To save your work, select SAVE TO DISK.

SAVING SETUP

You will see SAVING SETUP while the new setup is being saved on the Menu Disk.

You will be returned to the page of choices.

For Alex, select SAVE TO DISK. Also try out "test it!" as described below.

TEST IT!

20. Before leaving the Scan-Create program, it's important to test your scanning overlay. To test your overlay, **select TEST/SAVE/QUIT** from the Main Menu (described above), **then:**

1 - TEST IT!

2 - CHANGE METHOD/RATE

3 - CONTINUE EDITING/CREATING

4 - SAVE TO DISK

5 - QUIT

select TEST IT!.

TITLE: Sample

METHOD: REGULAR SCANNING

RATE: 5

TEST RUN: Press ESC to exit Test Mode

- APPLE keys may substitute for switches
- Text will appear in the window below

```
+++++  
+                                     +  
+++++
```

A TEST RUN page appears. You must have an AFC to use the Test Run page.

Press your switch or the OPEN-APPLE key — the array you created (array #1) will appear at the bottom of the screen.

Use your switch (or OPEN-APPLE key) to select items from the array. The COMPUTER RECEIVES for each item should appear in the test window.

For Alex, first select RIGHT, then DOWN, from the array. The cursor in the test box should move correctly, provided it has room to move (eg, it can't move UP or LEFT from the starting position).

NOTE: In TEST RUN mode, the TAB character produces no result. The DELETE character produces a shaded square. The CONTROL character and all other characters will operate. When testing ARROW characters, the cursor should move in the correct direction, provided it has room to move.

When done testing, press ESC. You will be returned to the page of choices.

CHANGE METHOD/RATE

21. To change the method or rate, select TEST/SAVE/QUIT from the Main Menu, then:

- 1 - TEST IT!
- 2 - CHANGE METHOD/RATE
- 3 - CONTINUE EDITING/CREATING
- 4 - SAVE TO DISK
- 5 - QUIT

select CHANGE METHOD/RATE, select the method and set the rate from the choices given.

CONTINUE EDITING/CREATING

- 1 - TEST IT!
- 2 - CHANGE METHOD/RATE
- 3 - CONTINUE EDITING/CREATING
- 4 - SAVE TO DISK
- 5 - QUIT

22. To return to the Scan-Create Main Menu, select **CONTINUE EDITING/CREATING**.

For Alex, select CONTINUE only if you have changes to make in the overlay.

QUITTING

23. When done with the setup, select **TEST/SAVE/QUIT** from the Main Menu, then:

- 1 - TEST IT!
- 2 - CHANGE METHOD/RATE
- 3 - CONTINUE EDITING/CREATING
- 4 - SAVE TO DISK
- 5 - QUIT

select **QUIT**.

If you have made changes since the last save, you will be asked if you want to save or throw out the changes.

- 1 - CREATE ANOTHER SETUP
- 2 - EXIT TO EXTENDED MENU

After quitting, two choices appear. To load and use the setup with application software or to write the description for the Description window, select **EXIT TO EXTENDED MENU**

If you got here by mistake, just press ESC to back up.

If, while using the Scan-Create program, you added an AFC.MACRO character to the overlay, the above window will also offer the choice **WORK WITH MACROS**. (See Chapter 17 for details about macros and the Macro Manager program.)

For Alex, if you have successfully programmed the UP DOWN array and would like to use it with Alex the Rabbit:

1. Select TEST/SAVE/QUIT.
2. Select QUIT.
3. Select EXIT TO EXTENDED MENU.
4. When the Extended Menu appears, press RETURN to get the Choices window for your new setup.
5. Press RETURN to LOAD the setup.
6. When the SETUP IN EFFECT window appears, put the Sample Application Software disk in the drive and press RETURN.
7. When the Sample Application menu appears, select Alex the Rabbit.
8. When Alex appears, press RETURN to start the game.
9. Press your switch and try using your new setup to run Alex the Rabbit.

The next sections will step you through creating a talking overlay, then will discuss creating an array for large-sized scanning and creating an overlay with multiple arrays. If you're not interested in the next sections, you can go ahead to "Listing Contents" on page 12-71.

TALKING ARRAYS

When you create a talking scanner setup, you add one step to the process: you create a USER HEARS for each item on the User Sees array. You may also, at your option, add SPEECH FEEDBACK to be spoken after an item is selected.

The steps for creating a talking array follow. As a specific example, we will continue with the Alex Up setup summarized in Figure 12-5.

1. Select ADD A NEW SETUP from the bottom of the Extended Menu (or select CREATE ANOTHER SETUP after quitting the Scan-Create program).
2. From the Construction Program menu, select SCANNING.
3. Enter a title for the new setup.
4. Select the type of overlay. In most cases, you will want to select CUSTOMIZED.

PLEASE SPECIFY SPEECH-FEEDBACK OPTION:

1: NONE

2: ECHO SPEECH SYNTHESIZER

3: EXTERNAL SYNTHESIZER

(INDICATE CHOICE AND PRESS RETURN)

5. The speech-feedback choices appear.

To create a talking scanner, simply select the type of speech synthesizer you will be using.

If you select a synthesizer that your disk is not configured for, the program will ask if you want the disk to be reconfigured. This will let your new setup — and all the other talking setups on this disk — use the new synthesizer. To change the configuration at a later time, you can use Other Options ... Change Speech at the end of the Extended Menu.

Note: If you create a setup for one synthesizer, then later reconfigure the disk for a different type of synthesizer, you may need to edit the USER HEARS in the overlay — see page 3-7.

6. After you select a synthesizer, the Scan-Create title page appears. Enter the number of arrays you want in this overlay.

For the Alex tutorial, you want one (1) array.

7. Select the width of the scan line.

For Alex, select 40-columns.

8. From the Scan-Create Main Menu, select WORK WITH AN ARRAY.

Array #1

- 1 - LAYOUT
- 2 - USER SEES
- 3 - USER HEARS
- 4 - COMPUTER RECEIVES
- 5 - OPTIONAL SPEECH
- 6 - WHAT NEXT?
- 7 - DONE

9. The array work menu appears. Notice the new topics: after User Sees comes User Hears, and after Computer Receives comes Optional Speech.

The cursor is on LAYOUT. Press RETURN.

10. Check the layout default settings and change these, if needed. When done, select OK AS SHOWN.

For Alex, the default settings of scanning pattern = one-at-a-time and segment length = 7 are fine. Select OK AS SHOWN.

11. From the work menu, select USER SEES. Create the User Sees line as desired. Press RETURN when done.

For Alex, create UP DOWN LEFT RIGHT as shown in Figure 12-5.

12. The work menu appears, with the cursor on the next step, USER HEARS. Press RETURN.

Array #1 -- USER HEARS

DOWN LEFT _RIGHT_ _

When the cursor highlights this item, the user will hear:

UP

Use right & left arrows to move cursor
or use up & down arrows + RETURN to:

MODIFY USER HEARS

GO TO NEXT STEP

13. The USER HEARS page appears.

The User Sees line will be near the top, with the first item highlighted by a cursor. The default text for USER HEARS will be in the middle of the screen.

To hear what this speech sounds like, move the bottom cursor to TEST SPEECH and press RETURN.

USER HEARS is what the speech synthesizer will speak when the cursor reaches that item on the array. If the USER HEARS for the first item sounds fine, you can proceed to test the next item on the array.

To test USER HEARS for each item on the array, use LEFT or RIGHT ARROW to move the top cursor, then move the bottom cursor to TEST SPEECH and press RETURN.

As a short cut for testing speech, you can also just press SPACEBAR, regardless of the position of the bottom cursor.

To modify USER HEARS for an item, move the bottom cursor to MODIFY USER HEARS and press RETURN. A cursor will appear on the USER HEARS line, and you can begin rewriting the text. This does not change the User Sees line — what you write will only change what the user hears. These commands apply to modifying USER HEARS:

ARROWS	move the cursor within the entry
DELETE	erases one character
CONTROL-X	clears the entire entry
CONTROL-Y	clears the entry from the cursor to the end

For Alex, the default speech will probably be appropriate, but feel free to experiment with changes.

When done editing a USER HEARS entry, press RETURN.

When done with the User Hears page, select GO TO NEXT STEP.

14. From the work menu, select COMPUTER RECEIVES. Enter the Computer Receives line as described in the non-talking part of this tutorial.

For Alex, remember to press ESC to enter the special characters of LEFT ARROW and RIGHT ARROW.

When done, select GO TO NEXT STEP.

15. From the work menu, select the next step, OPTIONAL SPEECH.

Array #1 -- SPEECH FEEDBACK (OPTIONAL)

DOWN LEFT _RIGHT_ _

After this item is selected, the user will hear this additional speech:

(none)

Use right & left arrows to move cursor
or use up & down arrows + RETURN to:

TEST SPEECH

GO TO NEXT STEP

The SPEECH FEEDBACK page appears.

The User Sees line is near the top, with the first item highlighted by a cursor.

SPEECH FEEDBACK is what the user will hear AFTER the highlighted item is selected. This speech is OPTIONAL in an overlay — the default, as shown in the middle of the screen is (none), that is, no speech feedback after an item is selected from the array.

To modify SPEECH FEEDBACK for an item, move the bottom cursor to MODIFY SPEECH FEEDBACK and press RETURN. A cursor will appear on the SPEECH FEEDBACK line, and you can begin rewriting the text. This does not change the User Sees line — what you write will only change what the user hears after selecting the highlighted item. These commands apply to modifying SPEECH FEEDBACK:

ARROWS	move the cursor within the entry
DELETE	erases one character
CONTROL-X	clears the entire entry
CONTROL-Y	clears the entry from the cursor to the end

For Alex, enter the speech feedback as shown in Figure 12-5. As you may recall, we decided to enter speech feedback for just two items so that when you test the array, you will be able to see the difference between having or not having speech feedback. You can then edit the array to add to or delete the feedback.

When done editing the entry, press RETURN.

To test SPEECH FEEDBACK for any item on the array, use LEFT or RIGHT ARROW to move the top cursor, then move the bottom cursor to TEST SPEECH and press RETURN.

As a short cut for testing speech, you can also just press SPACEBAR, regardless of the position of the bottom cursor.

When done with the page, select GO TO NEXT STEP.

16. The work array appears, with the cursor on the next step, WHAT NEXT? Press RETURN. Select what you want to happen next if the user does not select any of the items in this array.

For the Alex tutorial, select START OVER.

17. From the work menu, select DONE.
18. From the Scan-Create Main Menu, select TEST/SAVE/QUIT. Select SAVE TO DISK to save the setup on disk. Select TEST IT! to test the setup in the Test Run window.

In testing a talking scanner, notice the overall effect of USER HEARS and of any OPTIONAL SPEECH FEEDBACK you may have added. Sometimes when you actually *use* the setup, you find the speech is too long or too cumbersome, or just doesn't have the effect you thought it would. In this case, press ESC to exit Test Mode, select CONTINUE EDITING/ CREATING, then select WORK WITH AN ARRAY. From the array work menu, select the part of the overlay you want to change.

In the Alex example, Figure 12-5 suggested adding speech feedback for UP and LEFT. See what you think of the speech feedback when you use the Test Run window. Do you want to add speech feedback to the other items on the array? Or change it? Or delete it altogether? To make any of these changes, select OPTIONAL SPEECH from the array work menu.

19. When done with the setup, select DONE or press ESC from the array work menu. This brings up the Main Menu. Select TEST/SAVE/QUIT. Be sure to test any changes and save to disk before selecting QUIT.
20. After selecting QUIT, you can EXIT TO EXTENDED MENU to try out the setup with your application program, or select CREATE ANOTHER SETUP to continue with this tutorial.

LARGE-SIZE ARRAYS

When you create a scanning overlay, the characters in USER SEES are the normal 1/4-inch computer-text characters. When the AFC special option of SCAN SIZE = 2, these characters will appear in 20-column (1/2-inch) size, provided the application program uses full-screen graphics.

When creating a setup for large-size arrays, two considerations apply:

- (1) **The scanning array should be limited to 20 characters in length, rather than 40.** If SCAN SIZE = 2 and the array is longer than 20 characters, the first 20 characters will appear in large size on the screen. When the cursor has gone past those 20, it will continue to scan beyond them — you'll hear the cursor moving to the next items, but you won't see them.

To avoid creating an array with more than 20 characters, select 20-columns as the width of the scan line when you create the setup. The 20-column option is one of the first choices in the Scan-Create program. Selecting this option automatically sets SCAN SIZE = 2.

- (2) **The application program must use full-screen graphics.** This means the screen displays drawings or displays text that is different from typical 40-column or 80-column text.

If you are not sure about an application program, try loading the Up Down 20 setup or the Scan Large setup, then loading your program. If the characters in the scanning array appear in large size, your program *does* use full-screen graphics. If a program does not use full-screen graphics, the scanning characters will be normal 1/4-inch size, even if the special option of SCAN SIZE = 2.

MULTIPLE ARRAYS (BRANCHING)

The first page in the Scan-Create program asks "How many scanning arrays do you want to include in this new overlay?" The limit is ten.

When you enter a number of arrays greater than one, then select **WORK WITH AN ARRAY**, the program gives you a listing of your arrays.

Which array do you want to work with?

Array #1 = (undefined)

Array #2 = (undefined)

Array #3 = (undefined)

RETURN TO MAIN MENU

Use arrows to show which array, then
press RETURN.

You can create or edit the
arrays in any order.

How the movement between arrays will occur when the arrays are in use is called **BRANCHING**. Three branching methods are available:

BRANCH TO items	specific items in an array can consist of or include BRANCH TO commands
AFTER SELECTION	after any selection in an array is made, the scanner will automatically branch to a specified array
IF NO SELECTION	if the cursor goes off the end of an array and no selection has been made, the scanner will automatically branch to a specified array

How you use these types of branching will depend on the overall effect you want to achieve in the overlay. Examples of each of these are available in the "Designing ..." section, earlier in this chapter.

Programming Branching into an Overlay

This section assumes you have planned an overlay (as in Figure 12-6 or 12-7) and that you have already entered the Scan-Create program. (You can enter the Scan-Create program by selecting **ADD A NEW SETUP** or by selecting **Make Changes ... Overlay** to edit an existing setup.)

To enter a **BRANCH TO command**, select **COMPUTER RECEIVES** from the array work menu.

Array #1 -- COMPUTER RECEIVES

_ R<[] .+_ABCDE\ _FGHIJ=_KLMNO _QRST _VWXY

When the user selects this item,
the computer will receive:



Use these

<ARROWS
<DELETE
<CTRL-X
<ESCAPE
<RETURN

INSERT SPECIAL CHARACTER
(USE ARROWS + RETURN)

<NONE>
<AFC.BRANCH TO>
<ESCAPE>
<RETURN>
<SPACE>
<LEFT ARROW>
<RIGHT ARROW>
<UP ARROW>
<DOWN ARROW>
etc.

On the Computer Receives page, move the cursor to the User Sees item you want to contain the BRANCH TO command. If you want other Computer Receives characters before the BRANCH TO command, enter these first. When ready for the BRANCH TO command, press ESC to insert a special character.

Select the AFC.BRANCH TO character, then select which array the cursor should branch to when that item is selected.

Note: If you select array #10 to follow the BRANCH TO character, the COMPUTER RECEIVES will show '<BRANCH>:' A colon (or a zero), rather than the number 10, is needed to tell the AFC to branch to array #10.

To program AFTER SELECTION or IF NO SELECTION branching, select WHAT NEXT from the array work menu.

IF NO SELECTION

What should happen next if the user
does not select any of the items
in this array?

- 1 - QUIT SCANNING
- 2 - START OVER
- 3 - BRANCH TO ANOTHER ARRAY

Use arrows plus RETURN to select

The first page will be
IF NO SELECTION.

If you want branching to occur when the user makes no selection from this array, select BRANCH TO ANOTHER ARRAY.

A list of arrays will appear so you can select which array the scanner should branch to.

AFTER SELECTION

This overlay has more than one array.
Which array should be next after a
selection is made from this array?

1 - NEXT ARRAY = SAME

2 - NEXT ARRAY = DIFFERENT

Use arrows plus RETURN to select

The second page will be
AFTER SELECTION.

If you want branching to
occur after a selection is
made from the original
array, choose NEXT
ARRAY = DIFFERENT.

A list of arrays will appear
so you can select which
array the scanner should
branch to.

Getting an Overview

To get an overview of how different arrays in an overlay have been set up:

1 - WORK WITH AN ARRAY

2 - TEST/SAVE/QUIT

3 - OTHER OPTIONS

Get the Scan-Crete Main
Menu on the screen and
select OTHER OPTIONS.

1 - SEE OVERVIEW

2 - ADD A NEW ARRAY

3 - DELETE AN ARRAY

4 - LIST CONTENTS

5 - CALCULATE MEMORY

From the list of Other
Options, select
SEE OVERVIEW.

OVERVIEW OF SETUP

This setup contains 3 arrays

Array #1

Array #2

Array #3

RETURN TO

Array #1:

.....

GROUP-ITEM SCAN

SEGMENT LENGTH = 6

IF NO SELECTION:

QUIT SCANNING

AFTER SELECTION:

NEXT ARRAY = SAME

A listing of the arrays appears.

Move the cursor to the array you are interested in, then press RETURN.

An information window will appear which lists the scanning pattern, segment length, and 'what next' entries for this array.

To make any changes in an array, you must return to the Scan-Create Main Menu and select WORK WITH AN ARRAY.

To return to the Main Menu from the overview page, select RETURN TO MAIN MENU or press ESC.

Adding or Deleting Arrays

To add an array (up to 10), select OTHER OPTIONS from the Scan-Create Main Menu, then select ADD A NEW ARRAY.

You can insert the new array anywhere in your current list of arrays. Any branching arrangements within the arrays will be automatically changed to the new array numbers.

When done adding, select DONE ADDING or press ESC.

To delete an array, select OTHER OPTIONS from the Scan-Create Main Menu, then select DELETE AN ARRAY.

When done deleting, select DONE DELETING or press ESC.

LISTING CONTENTS

There are two ways to get the "listing of contents" in an overlay:

- If you are in the Scan-Create program, select **OTHER OPTIONS** from the Scan-Create Main Menu, then select **LIST CONTENTS**.
- If you are using the Extended Menu, bring up the Choices window for your setup. Select **GET MORE INFORMATION**, then select **OVERLAY**.

Please select:

- 1- DISPLAY ON SCREEN
- 2- SEND TO PRINTER

You can select
DISPLAY ON SCREEN
or
SEND TO PRINTER.

ARRAY #1

USER SEES:

R<#. +ABCDE\FGHIJ=KLMNO PQRST UVWX

COMPUTER RECEIVES:

<SPACE>
<RETURN>
<LEFT ARROW>
<BRANCH>2
<BRANCH>3
<REPEAT>
A
B
C

The screen will begin listing the contents of each array, showing User Sees and Computer Receives.

If this is a talking array, User Hears and Speech Feedback will also be shown.

Press any key to pause or continue the listing.

CALCULATING MEMORY

To calculate the amount of memory used in a setup, select **OTHER OPTIONS** from the Scan-Create Main Menu, then select **CALCULATE MEMORY**.

MEMORY FREE	=	3803
MEMORY USED	=	288
TOTAL MEMORY	=	4096

The screen will show you the memory that is free (still available), the memory that is used, and the total memory that is allowed for this setup.

Free memory is the maximum amount of memory left to use in the setup you are creating.

When your setups are small, you can fit as many as twenty on the Quick-Start Menu for the AFC Model G32. When your setups are larger (use up more memory), you may be limited to a smaller number on the Quick-Start Menu at any one time.

Some memory is used up whenever you add characters and arrays to the overlay. The more characters or more arrays you add, the more memory you use, but in most cases you will not come close to using up all the free memory.

An overlay with speech uses more memory than an overlay without speech.

For example, a talking standard overlay for the Echo takes up about five times as much memory as a standard overlay without speech. A talking overlay with speech for an external synthesizer uses up less memory than Echo speech but more memory than a non-talking overlay.

If you were to use all the free memory while creating the overlay, your setup would be so large that you could not add **MACROS** or **MOUSE TABS**. The setup would also be so large that with this setup on the Quick-Start Menu, no other setups could fit on the Quick-Start Menu at the same time.

More information about "size" of a setup is available on page 4-8.

Using or Changing the Setup

When you return to the Extended Menu, the new setup will be at the end of the menu. Your options include:

- Completing the Description window for this setup: press RETURN to bring up the Choices window, then select MAKE CHANGES ... DESCRIPTION.
- Trying out the setup with your application program: press RETURN to bring up the Choices window, then select LOAD THIS SETUP.
- Making changes in method, rate, overlay, or special options: press RETURN to bring up the Choices window, then select MAKE CHANGES ... then select the part of the setup you want to change.
- Moving the setup to any location on the Extended Menu, including the fixed Quick-Start Menu: highlight the setup, press CONTROL-R, then use ARROWS to move the setup.

See Chapter 6 for help with any of these options.

CHAPTER 13

ASCII INPUT

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CHAPTER 13

ASCII INPUT

This chapter will provide information about using the Adaptive Firmware Card as a keyboard emulating interface for certain communication devices. This chapter assumes you have read the Introduction and Chapters 1-2 and have used the hands-on demos in those chapters.

WHAT IS ASCII INPUT?

The ASCII-input methods allow you to use the AFC as a keyboard emulating interface (KEI) for certain communication devices. This means you can use the communication device, connected to the AFC, to operate the Apple.

The role of the AFC with a communication device is that of go-between: you use the communication device to select characters, the device sends them out through its output port to the AFC, and the AFC passes them on to the Apple.

For this to work, the device must have a parallel or serial output port, by which it can send characters in a standard form — ASCII (the American Standard Code for Information Exchange). You must also have a special cable which connects from that port to the AFC I/O box. Examples of devices which may be used with the AFC are:

- the ACS SpeechPAC/Epson by Adaptive Communication Systems, Inc.; cable to AFC made by Adaptive Communication Systems
- the Auto-MOD, Elementary MOD, and French Elementary MOD Keyboard Systems, by TASH Inc.; cable to AFC made by TASH
- the Touch Talker and Light Talker, by Prentke Romich Co.; cable to AFC made by Don Johnston Developmental Equipment, Inc.

Parallel, Serial, and Rate

The ASCII signal from your device is either parallel ASCII or serial ASCII. An AFC setup for a communication device must include an input method telling the AFC which type of signal to expect from the communication device — parallel or serial. If the device sends serial ASCII, you must also tell the AFC how fast the signal will be coming.

If your device sends PARALLEL ASCII:

- (1) the AFC method must be parallel ASCII
- (2) the AFC rate can be ignored (it has no affect in this method)

If your device sends SERIAL ASCII:

- (1) the AFC method must be serial ASCII
- (2) the AFC rate must correspond with the BAUD rate of your device (see your device manual for BAUD rate information)

If BAUD = 110	set AFC rate = 1
130	2
300	3
600	4

USING THE S.ASCII SETUP

Using the AFC with your communication device requires connecting the cable, setting up your device, and loading an ASCII setup. In this section, you will set up and test your device with the AFC and Apple, using the S.ASCII setup.

Getting Started

To use this section as a hands-on tutorial, you will need:

- An Adaptive Firmware Card, already installed
- Your copy of the AFC Menu Disk
- Your communication device
- The cable which connects your device to the AFC I/O box

Setting Up the System: Device-to AFC-to Apple

This tutorial will step you through using the Menu Disk to select and use the S.ASCII setup with your communication device.

PART 1: CONNECTING THE CABLE

With the computer and the communication device turned OFF, connect the cable from the device to the AFC. (See instructions from the cable manufacturer.)

PART 2: SETTING UP THE COMMUNICATION DEVICE

This pertains to readying the device to communicate with a computer. (See instructions from the cable manufacturer or in the device manual.)

PART 3: SETTING UP THE AFC

The plan will be:

- (1) Select the S.ASCII setup from the Extended Menu.
- (2) Use the Make Changes window to set the method and rate which match your communication device.
- (3) Load the revised setup and bring up the test window.

To do this, you can use the quick steps below or, for more detailed instructions, leave a marker here and go to "Using an 'S' or 'T' Setup" in Chapter 6. Read that section until you see a row of stars (***), then return here.

Quick Steps:

1. Boot the AFC Menu Disk.
2. Move the cursor to the S.ASCII setup; press RETURN.
3. Press RETURN again to get the Choices window on the screen.
4. Select MAKE CHANGES IN SETUP.
5. Select METHOD/RATE.

6. Respond Y to the caution window, then select the method and rate for your communication device. (See "Parallel, Serial, and Rate," page 13-2.)
 7. When the Choices window reappears, select LOAD THIS SETUP.
 8. When the SETUP IN EFFECT window appears, press T to Test the setup.
-

Using the Test Window

When the Test Mode window appears on the screen, you are ready to test the device-to AFC-to Apple setup.

Use your communication device to select a few letters. The letters you select should appear in the test window.

- IF THE LETTERS DO NOT APPEAR in the test window, the device-to AFC-to Apple system is not working properly. Proceed carefully through all instructions again.

For serial ASCII, double-check that the BAUD rate of your device matches the RATE setting in the S.ASCII setup.

For parallel ASCII, you may need to use an adapter for your AFC and cable. See "Technical Details" at the end of this chapter.

- IF THE LETTERS APPEAR in the test window, you may continue to experiment with the test window (see "'S' or 'T' Setup: Using the Test Window" in Chapter 6) or you may go ahead and use your device to run application software, as described below.

Using Application Software

You have been practicing the ASCII-input method with the AFC test window. To practice with application software, you could try Text Demo, Lemonade Stand, or Alex the Rabbit on your Sample Application Software disk, or any software of your own choosing.

CAUTION: There are a number of special characters, such as RETURN, OPEN-APPLE, and the ARROW keys, which may be required by application software and which may not be

immediately available with your communication device. Before trying your ASCII device with application software, we suggest you read "Getting Special Characters," on the next page.

To use application software with your device:

1. Select and load the S.ASCII setup (with the method and rate already set for your device). If you test it with the test window, press ESC to exit the window.
2. When the SETUP IN EFFECT window appears, remove the AFC Menu Disk and put in your application disk. Then press RETURN (or select RETURN with your communication device).

The application disk will boot, and you can use your communication device to run your application program.

Short Cuts for Advanced Users

Selecting setups from the Extended Menu is useful for a beginner, but a quicker way is to use the Quick-Start Menu which appears immediately when you turn on the computer, provided the AFC is turned ON. If the S.ASCII setup is on the Quick-Start Menu, you can select the setup from there — without using the Menu Disk at all.

For more information about quickly loading a setup, see "Short Cuts for Advanced Users" in Chapter 6.

Having Your Setup Active at Startup

The AFC is shipped from the factory with a setup called "Normal" in the #1 position — this means only the regular Apple keyboard, *not* ASCII-input, is active at startup. To have your method active at startup, all you need to do is move your preferred setup to the #1 position on the Menu Disk.

For instructions, see "Having Your Setup Active at Startup" in Chapter 6.

GETTING SPECIAL CHARACTERS

The computer keyboard contains a number of "special" characters which may not be included in your communication device. These include RETURN, ARROW keys, CONTROL, DELETE, OPEN-APPLE, RESET, to name a few.

Depending on your device, some of these special characters may be available, while others are not. In some cases, a "delete" function or arrow keys on a device are intended for internal use only, and are not sent out to the computer.

Before assuming that you will be able to run application programs through your device, it's a good idea to find out which of the Apple's keys the device does and doesn't duplicate. One way to do this is by simply experimenting. Another way is to refer to your device manual. In some cases, you'll find that you can generate a number of these characters by combining two selections from your device. For example, if your device has a CONTROL function, you can use these equivalents:

For	RETURN	use	<CONTROL> M
	ESC (ESCAPE)	use	<CONTROL> [
	LEFT ARROW	use	<CONTROL> H
	RIGHT ARROW	use	<CONTROL> U
	UP ARROW	use	<CONTROL> K
	DOWN ARROW	use	<CONTROL> J
	TAB	use	<CONTROL> I

Note: As discussed on page 13-8, a single ESC character acts as AFC.MACRO. Send ESC twice for use as ESC with an application program.

If your device is not able to generate certain special characters, two solutions are available: use strings of characters as suggested by the Trace standards or redefine rarely used characters in your device to be the special characters that you need. These two approaches are described on the following pages.

Approach #1: Trace Standards

The Trace Research & Development Center, Madison, Wisconsin, has proposed some standard ways that communication devices and KEI's can work together to generate special characters. The idea is to define certain "escape sequences" or strings of characters that any communication device

can send, and which will be interpreted as certain special characters by any KEI which follows the Trace standard.

The S.ASCII setup does follow the Trace standard, with a few minor changes. If the AFC receives one of the following strings, it will translate it into the corresponding special character. For example, if it receives the ESC character, followed by the four characters RET., it will generate the RETURN character.

<u>Special Character Sent to Apple by AFC</u>	<u>When AFC Receives This String from ASCII Device</u>
COMMAND/OPEN-APPLE	<ESC> COMMAND. or <ESC> OPEN-APPLE.
CONTROL	<ESC> CTRL.
DELETE	<ESC> DEL.
DOWN ARROW	<ESC> DOWN.
ESC	<ESC> ESC. or <ESC> <ESC>
KEYPAD	<ESC> KEYPAD.
LEFT ARROW	<ESC> LEFT.
AFC.MOUSE	<ESC> MOUSE.
OPTION/SOLID-APPLE	<ESC> OPTION. or <ESC> SOLID-APPLE.
AFC.REPEAT	<ESC> REPEAT.
RESET	<ESC> RESET.
RETURN	<ESC> RET.
RIGHT ARROW	<ESC> RIGHT.
SHIFT	<ESC> SHIFT.
TAB	<ESC> TAB.
UP ARROW	<ESC> UP.

NOTE: Some communication devices, such as the Touch Talker, generate the <ESC> character by using <CONTROL> + '['.

PROGRAMMING YOUR DEVICE

Your device may already follow the Trace standard. If it does, you will be able to use it with the S.ASCII setup without any further work on your part.

On the other hand, it may be up to you to put these special-character strings into the overlay of your device. You should do this before trying to use an application program. Of course, you don't need to program all of these characters into your overlay — you only need to program those that your application program requires.

MODIFYING THE S.ASCII SETUP

The S.ASCII setup uses the AFC's macro capability to handle the Trace standard strings. The <ESC> character from your device functions as the AFC.MACRO character, and the special string, such as RET., functions as the CODE NAME of the macro. (See Chapter 17, USING TEXT MACROS.)

What this means to you is that you can freely change any or all of these definitions to be whatever you like. This will let you:

- Use shorter strings for special characters, such as <ESC> R. for RETURN or <ESC> O. for OPEN-APPLE, etc. The advantage here is that the special-character strings will take up less memory in your device and might be easier to program. Please be sure to end any new CODE NAMES you create with a PERIOD — this will avoid conflict with other CODE NAMES stored in the setup. (See "Tips Regarding Code Names," Chapter 17.)
- Add your own "special characters." If you get involved in creating advanced macros, this might mean adding special complex functions to the list of capabilities built into your "KEI".

To modify the S.ASCII setup:

1. (Optional) Use CONTROL-C to copy the S.ASCII setup.
2. (Optional) Use Make Changes ... Description to change the title of the setup you will work with.
3. Use Make Changes ... Macros to enter the Macro Manager program.
4. (Optional) Select LIST MACROS to get a list of the present macros.
5. Select WORK WITH MACROS to create your new macros.

For "enter macro name," enter the special-character string which your device will send, including the PERIOD at the end. Do not include ESC at the beginning of the macro name.

For "enter message computer receives," press ESC for the special-character list, then select the character you need.

6. Be sure to select TEST/SAVE/QUIT and save your work.

Details about the Macro Manager program are available in Chapter 17.

Note: If you want to use the Trace strings for your special characters, but your device does not have an ESC character, you can select some other character, such as BACKSLASH (' \') to replace ESC. Change the AFC overlay, as described below, so that the new character is redefined as AFC.MACRO. Then use the Trace string <AFC.MACRO> ESC. for ESC. Also, you might want to create your own string to replace the "lost" character, which you used as AFC.MACRO.

Approach #2: Redefining Unused Characters

Another way to get special characters with your device is to redefine certain infrequently used characters (such as CURLY BRACKETS, TILDA, or BACKSLASH) to be the characters you need, instead. To do this, you can modify the S.ASCII setup by selecting Make Changes ... Overlay.

1. (Optional) Use CONTROL-C to copy the S.ASCII setup.
2. (Optional) Use Make Changes ... Description to change the title of the setup you will work with.
3. Use Make Changes ... Overlay to enter the Create-Overlay program.
4. Select WORK WITH OVERLAY.

For "specify character user sends," enter the character to be redefined.

For "enter character computer receives," press ESC for the special-character list, then select the special character you need.

5. Be sure to select TEST/SAVE/QUIT and save your work.

Details about the Create-Overlay program are available in Chapter 7.

SPECIAL AFC FUNCTIONS

The AFC is capable of several special functions which may make your communication device a more powerful computer "keyboard." These include the ability to send lower-case letters, even if your device cannot; automatic capitalization; a repeat function; mouse emulation, including user-definable tabs, macros, and a rotating arrow; and optional AFC speech feedback.

Upper-Case versus Lower-Case Letters

If your device has its own SHIFT and CAPS-LOCK characters — that is, you can send both upper- and lower-case letters (such as "A" and "a") — the AFC will pass these on to the computer exactly as received from your device. To send upper or lower case to the Apple, use the SHIFT or CAPS-LOCK character on your device.

You will not get lower-case letters on the computer screen if you are using application software which does not print in lower case. In fact, you might even get strange results — the same results as if you were typing lower-case letters from the Apple keyboard.

If your device does not have SHIFT and CAPS-LOCK characters — that is, you can only send upper-case letters (such as "A" but not "a") — the AFC can pass them on to the Apple as upper case OR convert and pass them on as lower case. This is described below.

To have the AFC convert your upper-case letters to lower-case for the Apple, you need to have a way of getting two special characters: CAPS LOCK and SHIFT. As described in the preceding section, "Getting Special Characters," you may use one of two methods:

- Program two items in your device for the Trace standard strings:
<ESC> CAPSLK. and <ESC> SHIFT.
- Make changes in the overlay of your AFC ASCII setup to redefine two rarely used characters to be these two functions.

You will use the CAPS-LOCK function to tell the AFC you want to lock into lower case, even though your device is sending upper case, or that you want to lock back into upper case. You will use the SHIFT function to shift a single character into upper case.

Auto-Caps

The special option of AUTO-CAPS is always available in an ASCII setup. Turning this option on means the AFC will automatically capitalize any letter you select after a period, question mark, exclamation point, or RETURN. (See Chapter 5.) This will work regardless of whether upper and lower case

functions are handled by your device or are handled by the AFC, as described above.

Repeat

Most communication devices do not include a repeat function — repeat is not vital for communication. The ability to repeat, however, can be indispensable with some kinds of computer applications.

The AFC provides a way that you can have a repeat function while you use your device to operate the computer. The way it works is this:

1. You must include a selection on your device which generates the AFC.REPEAT character. You may either redefine a rarely used character for this purpose or use the string, <ESC> REPEAT.
2. Send the character which you want repeated (such as RIGHT ARROW).
3. Select the AFC.REPEAT function.

Wait and watch: the character will start repeating automatically.

4. Select anything from your device (single character or string, it doesn't matter.)

The repeat will halt.

5. Wait for a brief time before sending any more text, or the AFC will take the new text as part of the selection you made in step 4.

The rate at which the repeat occurs is governed by the special option REPEAT RATE, which you may change through Make Changes ... Special Options or CONTROL-A 2. (See Chapter 5.)

Mouse Emulation

AFC mouse emulation gives you a way that you can use your device to operate mouse-based programs. This AFC capability is described at length in Chapter 18. You may wish to note the following specifics that relate to the ASCII-input methods:

- To enter mouse mode, send ESC, then send EQUALS SIGN ('='). Alternately, you may use the string ESC MOUSE. — this string will take you into mouse mode without the "entering mouse mode" prompt.
- Using ARROW characters or the rotating arrow mode for ASCII is similar to the repeat function and is described in Chapter 18.

Note: The special option of ROTATION METHOD should always = 1 for ASCII, i.e. ROTATION METHOD = 0 does not work well with ASCII.

Macros

The AFC macro capability gives you a way that you can add mouse and text macros to your AFC setup for use with particular applications. This capability is described at length in Chapters 17-18. You may wish to note the following specifics that relate to the ASCII-input methods:

- The ESC character is used as the AFC.MACRO character in the S. and T.ASCII setups. If your device cannot send ESC, you will need to redefine another character, such as "\" as the AFC.MACRO character. (See above.)
- If your device follows the Trace standard, the key labeled ESC may actually send the Trace sequence for ESC. This will work fine as the ESC key in an application, but it will not function as AFC.MACRO. (You need the raw ESC character for this.) You should redefine a different character, as above.
- When you create your own macros, keep in mind that the Trace strings are also macros. For example 'RET.' is a macro CODE NAME. If you create a macro with CODE NAME 'R', it will supersede this string! To

be save, always end your CODE NAMES with a '.' This will maintain compatibility with the Trace strings in the S. and T.ASCII setups.

Optional Speech Feedback

A talking AFC overlay is one which has been written to include the possibility of speech feedback. With the ASCII-input methods, this means a speech synthesizer speaks the name of the letter or character after the AFC passes the character to the Apple. **This adds speech to the ASCII input to the Apple, but it does *not* add speech to the application program or the communication device.**

To use speech feedback on a letter-by-letter basis, use the T.ASCII setup.

The Menu Disk comes configured for the Echo Speech Synthesizer. To change to an external speech synthesizer, see "Using AFC Speech Feedback," Chapter 3.

Note: Speech feedback with the AFC is limited to letter-by-letter or item-by-item feedback. Many communication devices give you the ability to spell out a word or phrase (letter-by-letter or word-by-word), and *then* have the synthesizer speak the whole utterance. The AFC does not have this ability.

To modify the speech feedback in an ASCII setup, use Make Changes ... Overlay, indicate the item you want to modify, then modify USER HEARS. (For help, see "Creating the Setup on Disk ... Changing or Deleting Entries" in Chapter 7.)

TECHNICAL DETAILS

Buffering

Most communication devices have their own "overlays," that is, they have items you see or hear and select, and messages which are displayed, spoken, or printed when you select an item. Depending on what is stored in your device, one selection may send out a single character or a very rapid string of many characters. The AFC handles such long strings by making use of a 160 character buffer. The way this works is: if the user of a communication device retrieves a message that has been stored in the device, that message is

sent out through the device's output port in a rapid-fire string of characters. The AFC absorbs the entire string and saves it in the AFC buffer, then passes the characters to the Apple, one at a time, as the application program requests them.

Handshaking: Serial ASCII

The serial ASCII mode offers two forms of handshaking: DSR/DTR (hardware handshaking) and XON/XOFF (software handshaking). If your device supports either form of handshaking, this will allow you to upload large text files to the Apple, by way of the AFC, and make the Apple think the source of text is the keyboard. If you're making your own cable, see Appendix B for pin assignments.

Handshaking: Parallel ASCII

If you set the AFC rate to 0, the parallel ASCII method will employ handshaking to receive input from a parallel device which uses a Centronix-type parallel port. This would include portable computers with parallel printer ports. If you're making your own cable, see Appendix B for pin assignments.

Parallel ASCII Adapter

The one-connector versions of the AFC Model G32 did not provide a means of "latching" a brief strobe from a parallel device. If you have a one-connector G32 card (the I/O box attached to the card by means of one connector, rather than two), you may need a special adapter or a special cable for the AFC to work correctly as an interface for the MOD Keyboard, for example. Contact the manufacturer of your device for details, or see Appendix B.

When using parallel ASCII with any Model G32 AFC, especially with the adapter described above, you will need to install jumpers on the two pairs of pins located in the corner of your AFC under the connector to the I/O box. See Appendix B.

CHAPTER 14

THE MULTIPLE SWITCH BOX

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CHAPTER 14

THE MULTIPLE SWITCH BOX

This chapter will provide detailed information regarding the multiple switch box method, including how to create your own setups and overlays. We assume you have read the Introduction and Chapters 1-2 in this manual and have made use of the hands-on demos in those chapters. A quick overview of the multiple switch box method is available in Chapter 3.

WHAT IS THE MSB METHOD?

The multiple switch box (MSB) *method* was designed for the person who can use one or more switches **as if the switches were keys** on an expanded keyboard: touching a switch immediately sends a character, word, or phrase to the Apple. No scanning or Morse code is involved.

For example, Alex the Rabbit requires the four ARROW keys on the Apple keyboard. In Chapter 1, you saw the option of running Alex with AFC scanning — you press one switch to scan through the words UP DOWN LEFT RIGHT. The MSB method provides another way to run Alex: you can have four switches connected to a multiple switch box (MSB), each switch sending a different ARROW key — no scanning or codes involved, just four different switches.

The MSB method can be ideal in a group setting, since four children could each have two switches, or eight children could each have one switch, and so on. If only one or two switches are needed, you can connect these to the jacks on the AFC I/O box. If three or more switches are needed, the switches must be connected to a **multiple switch box**.

A MULTIPLE SWITCH BOX (MSB) for the AFC is a box which connects to the 36-pin connector on the AFC I/O box and which has several mini-phone jacks for connecting switches. It can have up to 128 jacks.

The multiple switch box manufactured by Don Johnston Developmental Equipment, Inc. has eight jacks, so you can connect as many as eight switches. Each switch can send its own character, word, or phrase to the Apple. (For additional manufacturers, see Appendix C.)

Note: In the multiple switch box method, the OPEN-APPLE and OPTION/SOLID-APPLE keys *cannot* substitute for switches. You must use actual switches connected to the I/O box or to an MSB.

Method, Rate, and Overlays

The METHOD in an MSB setup is simply this: you touch a switch to send a character, word, or phrase to the computer.

The RATE in your MSB setup is an acceptance time — it affects how quickly the AFC responds to the switch closure.

With the MSB method, OVERLAY means the character or characters that each switch sends to the computer.

In the other AFC input methods, STANDARD overlays are available which contain all the same characters as the Apple keyboard. Since the multiple switch box method usually involves only a small number of switches, no standard overlays are available. When you use an MSB setup, you are using a CUSTOMIZED overlay which was created for a specific application program, such as

- a 4-switch overlay with four ARROWS for Alex the Rabbit (see Chapter 3)
- a 2-switch overlay with T and G for TAG Sampler
- an 8-switch overlay with the numbers 1-8 for Early Learning I (by Marblesoft).
- a 2-switch overlay with SPACE and RETURN (for any program needing only SPACE and/or RETURN)

You can label your switches with a *paper overlay*, that is, pictures, words, or colors which help the user know which switch does what. But it is the *stored*

overlay, data stored in the setup on your AFC Menu Disk, which tells the AFC what characters to send to the computer when each switch is pressed.

The information the computer receives when a switch is pressed may be a single character, a word, or any combination up to 100 characters long.

The overlay can contain up to ten LEVELS of information for the computer to receive; that is, any switch may hold up to ten different sets of characters, each on a different level. Commands to shift to a new level can be placed in the MSB overlay, but since this "uses up" one or more switches, it usually makes more sense for the teacher or helper to execute level changes from the Apple keyboard.

Several examples of MSB setups are included on your Extended Menu. (See Chapter 3 for a partial listing.)

Speech Feedback Options

WITH APPLICATION SOFTWARE

A set of switches that **talks and runs application software** can be useful in many situations, particularly for users who cannot read, have visual impairments, are auditory learners, or who have trouble associating the input from the switch with the effect in the software program.

With AFC SPEECH FEEDBACK, when you press a switch in the MSB method, a speech synthesizer "speaks" a character, word, or phrase, then sends certain characters to the computer to run the application program. This speech feedback option allows **the addition of speech feedback to the multiple switch box overlay** but does *not* add speech to the application program.

For information about using the speech feedback option, see "Using AFC Speech Feedback," Chapter 3.

FOR COMMUNICATION ONLY

The TALKING WORD BOARD program (TWB) is a special application program for people with limited speech abilities. It allows you to turn the

AFC, a speech synthesizer, and an expanded keyboard or MSB into a **talking communication board**. If you want to use switches, they *must* be connected to an MSB, not to the I/O box.

When you touch a switch, the speech synthesizer speaks the message (letter, word, or phrase) defined for that switch. The TWB can also say each message and remember a string of messages that can then be said together. The message appears on the screen and can be printed on the printer.

To use the TWB, you design your own paper overlays for your switches, then use the TWB disk to create stored vocabulary files. For example, a three-switch MSB setup could include an overlay where switch #1 says YES, switch #2 says NO, and switch #3 says MAYBE.

If you plan to use the TWB, we recommend reading and using the tutorials in this chapter to become familiar with the multiple switch box method. Then, for specific information regarding the Talking Word Board, boot the TWB program and select '0' for Instructions.

DISTINCTIONS

The Talking Word Board is NOT designed to work with other application software. The TWB is a dedicated application designed to work by itself.

- If you want switches that talk *and* run an application program, use the AFC Menu and Construction Disk to create an MSB setup with a customized overlay and *speech feedback* (See "Creating Your Own Setup," this chapter.)
- If you want switches dedicated to *communication only*, use the Talking Word Board program to create and save a stored TWB vocabulary file. (TWB files are not the same as setups; they cannot be saved on the Menu Disk or the Quick-Start Menu.)

CREATING YOUR OWN SETUPS

The following tutorial will step you through creating an MSB setup, using TAG Sampler (on your Sample Application Software disk) as the example application software. Because TAG Sampler only requires two keys (T and G), we can create an MSB setup using two switches connected to the AFC I/O box. To create an MSB setup for three or more switches, you must have a multiple switch box.

Planning an MSB Setup

Creating a setup for the multiple switch box method involves planning how many switches to use and what function you want each switch to have in the application program.

LEARNING THE APPLICATION SOFTWARE

The first step is to **familiarize yourself completely with the application software**. This means running the application program by means of the computer keyboard or by an AFC method with a standard overlay.

We will be using TAG Sampler as our sample application program. If you are not already familiar with TAG Sampler, you should work with it now. Turn the AFC off (if you are using the computer keyboard), boot the Sample Application Software disk, and select TAG Sampler.

Make a list of all keys and key combinations needed to run the program. This includes letters, numbers, special characters, control keys, etc. The best way to do this is to run the program and write down every key on the keyboard that is needed to run the program successfully. Two points deserve note:

- (1) Be sure to write down **every key needed, including RETURN and SPACEBAR**. Such keys, easily taken for granted, may be very important in your overlay.

- (2) **List any key combinations** which may be useful to you in your MSB overlay. You might want one switch to send **one character** to the computer, or you might want one switch to send a combination or **string** of characters, such as a name plus RETURN.

The keys required to operate TAG Sampler are:

<u>Keys</u>	<u>Result</u>
T	Brings up the trike
G	Brings up the glass

PLANNING THE NUMBER OF SWITCHES

Once you are familiar with the application program, the next step is to consider how many switches you will be using. This will depend on :

- whether this will be a one-person activity or a group activity
- the number of switches each person can comfortably use
- the number of switches you have available

For TAG Sampler, we will assume this is a one-child activity, that two switches are available, and that the goal is for the child to look at and choose between two switches.

DECIDING THE ITEMS TO INCLUDE

Next, you must **decide what characters or character combinations you want in the overlay**. This will be based on the requirements of the application software, the goals of the computer activity, and what you know about the abilities of the user. Each item may be a single character, such as one letter, or a string of up to 100 characters. The characters you choose could be the entire list you wrote down when reviewing the software or a modification of that list, since you may not be planning to use all the characters required in the application software.

For example, you might be creating an overlay for the full TAG program (more than 25 graphics) for a child who has difficulty

choosing between two items. It would make no sense to present this child with a choice of ten pictures. So you would probably choose to limit the choices at any one time to two items. (You could easily change the items by making use of levels — this will be discussed later in this chapter.)

In the case of TAG Sampler, we only have two items available, so we can assume the items we want in the overlay are T (for trike) and G (for glass).

PLANNING FOR EACH SWITCH

You will need to decide, for each switch:

- (1) **SYMBOL:** what symbol will be used on the switch
- (2) **COMPUTER RECEIVES:** what characters the AFC will send to the computer when that switch is pressed
- (3) **SPEECH FEEDBACK:** what the user will hear when that switch is pressed (if this will be a talking overlay)

The easiest way to plan this is to make a simple worksheet. Figure 14-1 shows a worksheet for our example of TAG Sampler.

Switch Numbers (optional)

SWITCH NUMBERS are simply your personal reference for each switch you will be using. This is not required by the AFC but will help you remember which switch does what. Figure 14-1 shows switch numbers in the first column of the worksheet.

Figure 14-1. Worksheet for an MSB Overlay for TAG Sampler

Name of Program: TAG Sampler (by Pyramus)

Name of Setup: MY TAG

Level #: 1 of 1

Switch # (your ref only)	SYMBOL on switch	COMPUTER RECEIVES	SPEECH FEEDBACK (optional)	RESULT in Application
1	color photo: child's trike	T	"I want to ride." <i>(not for Echo)</i>	Tricycle appears
2	color photo: child's cup	G	"I want a drink." <i>(not for Echo)</i>	Glass appears

Symbols

The SYMBOLS you place on your switches can be letters, words, Picsyms, Blissymbols, drawings, stickers, screen dumps of program graphics, or whatever will denote the appropriate selection to the user. What you show on the switch does not have to be identical to what the COMPUTER RECEIVES when that switch is pressed — it just needs to be related in a way that makes sense to the user. The abilities of the user and the goals of the activity should strongly influence your symbol selection.

For example, if an early childhood counting program requires the user to respond with the numbers 1 through 3, the numbers could be represented on the switches in several ways: with numerals (1, 2, 3); with words (one, two, three); with pictured quantities (one jelly bean, two jelly beans, three jelly beans); or,

if the child knew sign language, with pictures of the hand signs for these numbers.

In our TAG Sampler example, let's plan to use color photographs to represent the tricycle and glass. We'll place one photograph on or near each switch. These are listed in the SYMBOL column on the worksheet (Figure 14-1).

Computer Receives

Once you've listed the switches by number and by symbol, you're ready to fill in the COMPUTER RECEIVES column on your worksheet. Using the original list of keyboard characters you wanted to include in the overlay, fill in the COMPUTER RECEIVES column with the exact character or characters you want the AFC to send to the computer when that switch is pressed.

*CAUTION: The important factor here is that the application program do what you want it to do when a switch is pressed — the **COMPUTER RECEIVES** for each switch must be the character or sequence of characters required by the application program to produce the **RESULT** you desire.*

Figure 14-1 shows, for each switch, the SYMBOL and the COMPUTER RECEIVES plus the RESULT we are expecting in the application program.

In our TAG example, the switch with the picture of a trike doesn't send the word TRIKE to the computer – it sends the letter "T," because it is the letter "T" that produces the trike on the screen. Similarly, the switch with the picture of a cup doesn't send CUP or even the letter "C" – it sends a "G" in order to produce a glass on the screen.

Also in our example, each switch only sends **one character** to the computer, because that is all we need in this application. Remember, however, that one switch in the overlay could send a **string** of up to 100 characters as well.

Speech Feedback (optional)

If you are creating a talking overlay, you should also consider, for each switch, what you want the speech synthesizer to say when that switch is pressed, and write this down on the worksheet. You don't need to worry, at this point, how the speech will sound. Once you are creating the overlay on disk, you will be able to hear what the speech sounds like.

In some applications, what the user hears may be the same as what the COMPUTER RECEIVES, such as the name of a letter. In other applications, such as TAG Sampler, this would not make sense.

In the case of TAG Sampler, if you have an Echo speech synthesizer, speech feedback is already provided by the application software. **If you have an Echo speech synthesizer, do not add AFC speech feedback for TAG Sampler:** you will get an excess of speech! If you have a different type of speech synthesizer (see Chapter 3), you may want to add your own speech feedback by means of the AFC.

The SPEECH FEEDBACK column in Figure 14-1 shows a plan for speech feedback in case, instead of an Echo, you have an external speech synthesizer.

DESIGNING LEVELS

This section discusses LEVELS. Levels are important only if you need more than one. In our TAG Sampler example, we only need one level. If you are reading this chapter for the first time, feel free to skip ahead to "Creating the Setup on Disk," so that you can create and use the overlay we have designed so far. Then, at a later time, come back to this section to read about designing an overlay that has more than one level.

In some applications, you may have reason to design an MSB overlay which has more than one LEVEL. A typewriter keyboard, for example, may be thought of as having two levels: you use the SHIFT key to shift between levels.

When you use the lower level, you get lower-case letters or whatever character is lower on two-character keys, such as

numbers, =, and /. When you SHIFT into the upper level, you get upper-case characters or whatever character is upper on two-character keys, such as !, @, #, \$, and ?.

With the AFC multiple switch box method, **your switches may have as many as ten levels in one overlay**. You shift between levels by means of level-shift commands (from the Apple keyboard or from the switches). As with the typewriter keyboard, the characters the computer receives when a switch is pressed depends on the level you are using at that time.

Levels may be used in different ways. With the multiple switch box method, you may have more items than you have switches — or more items than switches that the child can use at one time. One solution is to design an overlay where different items are stored on different levels for each switch. When you are using this multi-level overlay with the application program, you can quickly and easily change the function of the switches by shifting to a new level (and changing the symbols on the switches) — without losing the application program.

For example, you may have the full TAG program with more than 26 graphics. You have selected six of these to begin training with your child, but the child can only use two switches at one time. In this case, you could have three levels of two graphics each.

Levels can also be used to change the speech feedback — different levels in the MSB overlay could generate different types of speech feedback for the same paper overlay and computer-receives characters — you change the speech feedback by simply shifting levels.

When you plan a multi-level overlay, you must:

- plan how the shifting between levels will occur — decide if it should be done from the switches or from the Apple keyboard
- plan the COMPUTER RECEIVES and (optional) the SPEECH FEEDBACK for each switch in each level

Shifting Between Levels

There are two ways to shift between levels:

FROM THE SWITCHES:

Changing levels can be accomplished by pressing a switch, if the switch has a special AFC.LEVEL character as part of COMPUTER RECEIVES. In most MSB setups, however, you will want to avoid "using up" switches in this way.

FROM THE APPLE KEYBOARD:

Changing levels can always be accomplished directly from the Apple keyboard (CONTROL-A 5 plus the new level number — see Chapter 4). This is useful in applications where the number of switches is limited and/or where it is appropriate for the trainer, rather than the user, to change the levels — in such cases, dedicating switches in the overlay for level-shift commands may not be necessary.

If the user will be changing levels through the switches, you will need to decide the LOCK/REVERT status. If you leave any switches undefined in some levels, you'll need to decide the FALL-THROUGH status.

LOCK/REVERT status and FALL-THROUGH status are discussed in "Planning Levels," Chapter 7. Read until you see the line of stars (***), then return to "Creating the Setup On Disk," on the next page.

Creating the Setup on Disk

Before creating a setup on disk, it's helpful to have a quick overview of the process:

Extended Menu → Construction Programs → Extended Menu
(ADD A SETUP) (CREATE, SAVE, QUIT) (LOAD and use setup)

First you select ADD A SETUP from the bottom of the Extended Menu. This takes you to the setup Constructions Programs — you select a method and create an overlay. When done, you SAVE the setup on disk, then QUIT. Selecting QUIT takes you back to the Extended Menu, where you can LOAD the setup in the usual way and use it with an application.

Each screen and each step is described in detail in Chapter 7. The only variations relating to the multiple switch box method are:

- The screen will use the word "switch," rather than "item," eg. "Touch switch user touches," rather than "Indicate item user selects."
- To "touch switch," you can:
 - touch the (1-2) switches connected to your I/O box, or
 - touch the (1-8) switches connected to your MSB, or
 - enter the AFC's code name for that switch, as described in the tutorial below (step 8)

SUMMARY WITH "TAG SAMPLER" EXAMPLE

Quick steps for creating a setup are given below. If you have switches, connect them to the I/O box or your MSB before you turn on the computer. Instructions for the TAG Sampler example are in small italics — you'll need to have your worksheet (Figure 14-1) available to work from. For more detailed instructions, without the TAG Sampler example, use "Creating the Setup on Disk" in Chapter 7. (The step numbers below and in Chapter 7 are the same. A step marked "b" here is unique to the multiple switch box method.)

Getting Started

1. Boot the Menu Disk. Press '9' (or use SPACEBAR or ARROWS) to select ADD A NEW SETUP from the bottom of the Extended Menu.
2. From the list of input methods, select MULTIPLE SWITCH BOX.
3. Enter a TITLE.

For the TAG Sampler tutorial, enter the title from the worksheet, "My TAG."

4. No choice for TYPE OF OVERLAY is available: all MSB setups require a customized overlay.
5. Select your SPEECH-FEEDBACK choice.

For TAG, if your speech synthesizer is an Echo, select NONE for speech feedback.

6. When the CREATE OVERLAY MAIN MENU appears, you can begin defining switches in any level of the overlay.
 - To work with Level 1, select WORK WITH OVERLAY.
 - To work with another level, select USE LEVELS, then select CHANGE LEVELS.
 - When you have finished the overlay, you will select TEST/SAVE/QUIT.

To begin the TAG overlay, select WORK WITH OVERLAY.

7. A prompt to turn on your AFC may appear.

Basic Steps

You are now ready to begin defining switches. The basic steps for each switch will be (don't do this yet):

- (1) Touch switch user touches.
 - (2) Enter characters computer receives.
 - (3) Enter speech feedback user hears (if you opted for speech feedback).
 - (4) When done, select TEST/SAVE/QUIT and SAVE your work to disk.
8. **To TOUCH SWITCH USER TOUCHES**, just touch the first switch you want to define.

In the TAG tutorial, touch the switch you will be using for UP ARROW.

If your switches or AFC are not available, you can still create an MSB setup, provided you have previously noted the AFC's code names for switches connected to your MSB. The code name is a letter-number combinations, such as J2, P8, etc. If this is an MSB setup for two switches connected to the AFC I/O box, the code names are:

I/O jack #1: XX

I/O jack #2: YY

For the TAG example, we will be using the AFC I/O box, so the code names are XX for switch #1, YY for switch #2.

If this is an MSB setup for a multiple switch box, the code-names will depend on how the box was made. (The MSB from Don Johnston Developmental Equipment, Inc. uses the code names I1, J2, K3, L4, M5, N6, O7, P8). If you write down the code names the first time you create an overlay with your MSB, you'll have them for future reference.)

When the screen says "Touch switch user touches," you can press the switch or enter the switch's code name from the Apple keyboard then press RETURN.

9. The screen changes to show the AFC's code-name for the switch you touched.

To ENTER CHARACTERS COMPUTER RECEIVES, press the keys for the character or characters you want the computer to receive when this switch is pressed.

CAUTION: In most cases, you can just press the keys for the characters you want to enter in **COMPUTER RECEIVES**. Special considerations, however, are: upper versus lower case and "special" characters such as **LEFT ARROW**, **RIGHT ARROW**, **ESC**, or **RETURN**. To enter "special" characters, press **ESC** when the screen shows "Enter characters computer receives," then select the character you want from the special-character window. For help or a listing of special characters, see Chapter 7, step 9.

*For TAG, the **COMPUTER RECEIVES** for switch #1 is T. For switch #2, it is G. Press the key for the appropriate letter, then press **RETURN**.*

10. If you selected a speech synthesizer, the screen will show **ENTER SPEECH FEEDBACK USER HEARS**. For help, see Chapter 7, step 10.

For TAG, if you have a serial-type speech synthesizer, enter the speech feedback shown in Figure 14-1.

11. When the screen changes, you can press **SPACEBAR** to hear the speech again. Your choices are at the bottom of the screen. If everything is as you want it, just press **RETURN** to **PROCEED TO NEXT SWITCH**. For help with changing or deleting entries, see Chapter 7, step 13.

12. Repeat steps 8-11 to **PROGRAM EACH SWITCH** you want to define. The following information is available in Chapter 7:

- | | |
|---------------------------------------|------------------------|
| 9. Enter characters computer receives | 17. Test it! |
| 10. Enter speech feedback user hears | 18. Change method/rate |
| 13. Changing or deleting entries | 19. Continue creating |
| 14. Listing contents | 20. Quitting |
| 15. Free memory | 21. Multiple levels |
| 16. Saving your work | |

Test/Save/Quit

To use this setup, you must first **SAVE** it on disk. In fact, it is a good idea to save your work fairly often (such as every 10 minutes), even if you are not done. To save the setup you are working on, **follow the prompts on the screen to return to the Create Overlay Main Menu**. From the

Create Overlay Main Menu, select TEST/SAVE/QUIT, then select SAVE TO DISK.

You can also select TEST IT! from the Test/Save/Quit choices, to test your setup in a Test Run window.

To use the setup with your application software, you must first return to the Extended Menu. The safest way to do this is to select QUIT from the Test/Save/Quit choices. The screen will then offer the choices: CREATE ANOTHER SETUP or EXIT TO EXTENDED MENU.

If, while using the Create Overlay program, you added an AFC.MACRO character to the overlay, the screen will also offer the choice WORK WITH MACROS. (See Chapter 17 for details about macros and the Macro Manager program.)

If you are ready to use your setup with application software, select EXIT TO EXTENDED MENU.

Using or Changing the Setup

When you return to the Extended Menu, the new setup will be at the end of the menu. Your options include:

- Completing the Description window for this setup: press RETURN to bring up the Choices window, then select MAKE CHANGES ... DESCRIPTION.
- Trying out the setup with your application program: press RETURN to bring up the Choices window, then select LOAD THIS SETUP.
- Making changes in method, rate, overlay, or special options: press RETURN to bring up the Choices window, then select MAKE CHANGES ... then select the part of the setup you want to change.
- Moving the setup to any location on the Extended Menu, including the fixed Quick-Start Menu: highlight the setup, press CONTROL-R, then use ARROWS to move the setup.

See Chapter 6 for help with any of these options.

MULTIPLE SWITCH BOX OVERLAY WORKSHEET

Name of Application Program: _____

Name of Setup: _____

This overlay consists of how many levels? (1-10) _____

Level # _____

Switch # (your ref only)	Symbol on switch	COMPUTER RECEIVES	SPEECH FEEDBACK (optional)	RESULT in Application
-----	-----	-----	-----	-----

CHAPTER 15

ONE SWITCH, TWO SWITCH RED SWITCH, BLUE SWITCH

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CHAPTER 15

ONE SWITCH, TWO SWITCH RED SWITCH, BLUE SWITCH

When a young child can physically control only one or two switches, and when that child is not ready to use standard scanning or standard Morse code, the question of where to begin or how to proceed with the AFC is not always clear. Much depends, of course, on the abilities and needs of the individual child and the nature of the application software you have selected. Two chapters in this manual may be helpful: This chapter, ONE SWITCH, TWO SWITCH ..., provides an overview and examples of different ways the AFC may be set up to use one or two switches to control and interact with early educational software. The next chapter, FACTORS AND RESOURCES, describes factors which may influence successful use of an AFC input method and suggests resources, in terms of people and readings.

Keep in mind that the goal with a young child is not always "will independently use the computer." Your goals may be "will use...", "will enjoy...", "will interact with other children...", "will take turns...", "will control the switch with minimal increased muscle tone..." The question becomes: how to best "set up" a given program for a specific child? We hope the examples in this chapter will help you approach application software with a view toward determining (1) how it is *supposed* to be used (how it works) and (2) how you can creatively use it with the AFC to serve *your* purposes with *your* child.

Throughout this chapter, we refer to particular commercially-available programs by name, as concrete examples of ways that the AFC may be used with young children. (For publishers, see Appendix D). These programs are examples only — they constitute a tiny fraction of the wealth of good software available, and no endorsement of these programs over others is intended.

GETTING STARTED

Your first task in setting up the AFC is to use your application software and determine how it is supposed to be run. Early educational software is likely to require you to press a switch or game button, to press a small number of keys, or to use a pointing device, such as a mouse, joystick, or paddles. Before you can "set up" the AFC to use switches with your program, you must know how the program *expects* to be run.

IF THE SOFTWARE SAYS "PRESS A SWITCH..."

A small number of programs have been written with switch input in mind. In some, an arrow or box moves on the screen, and you press your switch when the arrow/box is in the "right place." Examples include The Rabbit Scanner, by Exceptional Children's Software; Interaction Games, by Don Johnston Developmental Equipment; and Shapes Dragon, on your Sample Application Software disk (see Chapter 3). In other programs, you press the switch to make something interesting happen, as in Creature Antics by Laureate Learning or in Colors/Tones, on your Sample Application Software disk (see Chapter 5).

You will know your software is designed for switches if the instructions tell you to "press a switch," as in

This fierce dragon likes to burn shapes. If you can match the shape that he is sitting on, he will burn it up! When the arrow points to a shape that is the same, press your switch.

To use a switch-input program with the AFC, all you need to do is:

- (1) Connect 1-2 switches to the I/O box. (If only one switch is needed, be sure to connect it to jack #1.) If you want to use your Unicorn Keyboard as two switches, just connect it to the I/O box.
- (2) Use either the NORMAL or the SW INPUT setup on your Extended Menu.

These two setups, NORMAL and SW INPUT use the AFC normal-input method. This method assumes you do *not* want keyboard emulation (you do not want the switches or expanded keyboard to act as keys) but that you *do* want to use some function of the AFC. When you use a switch or the Unicorn Keyboard with switch-input software, you are using the "normal" input method for that software. You turn the AFC ON only because your input device is connected to the AFC I/O box. (If your AFC is off, the Apple will not know if/when you press the switches or Unicorn.)

UNICORN: When you use the Unicorn Expanded Keyboard with the NORMAL or SW INPUT setup, the *right half* of the Unicorn will automatically become switch #1, and the *left half* will become switch #2. With the Unicorn Keyboard Model I, use of a dead-spot eliminator is recommended. (See "Adaptations to Keyboards," in the next chapter, FACTORS AND RESOURCES.)

More Info

- For information on the normal-input method, see Chapter 3.
- For a demo using the SW INPUT setup with Shapes Dragon, see "Demos," Chapter 3.
- For a demo on slowing down switch-input software, see "Learning About SLOWDOWN," Chapter 5.

IF YOU ONLY NEED A FEW KEYS

With many early educational programs, the child is supposed to touch a small number of keys, such as SPACE and RETURN, or the numbers 0-9, or a handful of certain other keys. To substitute 1-2 switches with this type of software, you may use

- the multiple switch box method
- redefined or customized Morse code
- customized scanning

Which method you choose will depend in part on the number of switches your child can use and on the number of keys needed to run the program. We'll give examples first for software that only requires two keys, then for software which requires more keys. (For information on using an expanded keyboard, rather than switches, with this type of software, see the chapter titled THE EXPANDED KEYBOARD.)

Two Items Only

Some software for young children only requires that you press one or two keys, such as SPACE and RETURN. An example on the Sample Application Software disk is the TAG Sampler — this sampler requires only G (for glass) and T (for trike).

TWO ITEMS WITH TWO SWITCHES

With the **multiple switch box (MSB) method**, you use a setup with a customized overlay, where one switch sends one item, such as SPACE, and the other switch sends the other item, such as RETURN. Pressing switches in the MSB method is the same as pressing keys on the Apple keyboard.

If 3 or more switches are involved, you must connect these to a multiple switch box, which connects to the AFC I/O box. **If only 1-2 switches are involved you can connect these directly to the I/O box** and use an MSB setup *without* using a multiple switch box at all.

In a two-item application, the child must be able to use two switches for this to be an independent activity. It could also, of course, be a shared activity. Examples on your Menu Disk include:

Space Ret	MSB	Any program needing only SPACE and RETURN
Drink Ride	MSB	TAG Sampler

More Info

- For more examples using a multiple switch box, continue reading this chapter.
- For an overview of the multiple switch box method, see Chapter 3.
- For details on the multiple switch box method, including how to create a setup, see the chapter titled MULTIPLE SWITCH BOX.

Another way to use two switches is to use **redefined codes**, where switch #1 produces a short, high tone and sends one item (such as SPACE) and switch #2 produces a long or low tone and sends the other item (such as RETURN). The child is not learning Morse code — the child simply uses one switch to send SPACE and another switch to send RETURN. This is very similar to the MSB method, except that the switches produce tones. The type of tones

produced depends on which Morse code method you use and what rate you set. Examples on your Menu Disk include:

Space Ret	code	Any program needing only SPACE and RETURN
DrinkRide	code	TAG Sampler

More Info

- For more examples of redefined codes, continue reading this chapter.
- For instructions on creating a setup with redefined codes, continue reading this chapter.
- For an overview of Morse code as an input method, see Chapter 3.

TWO ITEMS WITH ONE SWITCH

If your child uses one switch, you can use a setup with a **customized scanning overlay**, so that when you press the switch, two items appear. The cursor points to each item in turn. Any of the AFC scanning methods can be used. As an example, the two items might be SPACE and RETURN. If you use the switch to select SPACE, the AFC sends a SPACEBAR to the computer. If you select RETURN, the AFC sends a RETURN. If the words SPACE and RETURN are not meaningful to the user, you could display words like MOVE (if that is what the SPACEBAR does) and SELECT (if RETURN is used to select something). For the TAG sampler, the two items might be DRINK and RIDE: DRINK sends a G (for glass) and RIDE sends a T (for trike.) With AFC speech feedback, the items on your scanning line can be spoken aloud — this can make the process of scanning more concrete for young children. If your application program uses full-screen graphics and if the scanning line has no more than 20 characters, you can enlarge the characters to approximately 1/2 inch by means of the special option of SCAN SIZE. Examples of two-item scanning on your Menu Disk include:

Space Ret	scan	Any program needing only SPACE and RETURN
Drink Ride	scan	TAG Sampler

More Info

- For a demo using customized scanning with Alex the Rabbit, see Chapter 1.
- For an overview of scanning, see Chapter 3.
- For details on scanning, including how to create a customized overlay, see the chapter titled SCANNING.

More Than Two Items

Some programs call for a handful of keys, such as the numbers 0-9 or a selected set of character keys. For example, in the "program" portion of Golden Edition Facemaker,TM by Spinnaker, the child needs eight keys to have the face perform up to eight different actions:

W = Wink	S = Smile	E = Ears wiggle	D = Dance
C = Cry	F = Frown	T = Tongue out	X = Cross Eyes

One option is a multiple switch box with eight switches — as a shared activity for several children. (See "Group Interaction ... Red Switch, Blue Switch," later in this chapter.) As an independent activity for a child who can use one or two switches, you can use either customized scanning or redefined codes, as described below. Both are excellent training tools.

SEVERAL KEYS WITH ONE SWITCH

For a one-switch user, a **customized scanning overlay** with a few items on the array may be ideal. In Chapter 1, you used Alex the Rabbit by means of one switch and a scanning array with four words: UP DOWN LEFT RIGHT. For Golden Edition Facemaker, eight items would allow the child to produce all of the animations.

USER SEES:	WINK	SAD	HAPPY	MAD	DANCE	EARS	OUT	CROSS
------------	------	-----	-------	-----	-------	------	-----	-------

Keep in mind that COMPUTER RECEIVES does not have to be a single letter. In the MAKE FACES setup on your Menu Disk, we created an overlay such that multiple characters are sent when the child makes a selection. This means that selecting WINK gets not one wink from Facemaker, but three, as shown below.

USER SEES:	WINK	SAD	HAPPY	MAD	DANCE	EARS	OUT	CROSS
------------	------	-----	-------	-----	-------	------	-----	-------

COMPUTER

RECEIVES:	WWW	CCC	SS	FF	D	EETE	TTT	XX
-----------	-----	-----	----	----	---	------	-----	----

If speech feedback is an option, you can also add what the USER HEARS as the cursor moves across each word. In the Facemaker example, USER HEARS might be:

USER SEES:	WINK	SAD	HAPPY	MAD	DANCE	EARS	OUT	CROSS
------------	------	-----	-------	-----	-------	------	-----	-------

USER HEARS:	<i>wink</i>	<i>sad</i>	<i>happy</i>	<i>mad</i>	<i>dance</i>	<i>wiggle</i>	<i>tongue out</i>	<i>cross</i>
-------------	-------------	------------	--------------	------------	--------------	---------------	-------------------	--------------

COMPUTER

RECEIVES:	WWW	CCC	SS	FF	D	EETE	TTT	XX
-----------	-----	-----	----	----	---	------	-----	----

If an array with these eight words is too complex for a child, you could begin with an array with just two or three words. A program like Facemaker, in fact, yields nicely to simple arrays for beginning use, with increasingly more complex arrays for more advanced use. Yolanda Nieuwesteeg has suggested three sets of arrays for an earlier version of Facemaker ("Creating scanning arrays with the Adaptive Firmware Card," *Closing the Gap*, Vol. 5, No.6, Feb/Mar, 1987, p.16):

Facemaker 1: SPACE, RETURN

Facemaker 2: SPACE, RETURN, W C T F S

Facemaker 3: SPACE, RETURN, W C T F S 1 2 3 4 Y N

Examples on your Menu Disk include:

Make Faces	scan	Golden Edition Facemaker
Up Down	scan	Alex the Rabbit
Rotating >	scan	Alex the Rabbit

Lemonade	scan	Lemonade Stand
Space Ret	scan	Any program needing only SPACE and RETURN
Drink Ride	scan	TAG Sampler

More Info

- For a demo using customized scanning with Alex the Rabbit, see Chapter 1.
- For an overview of scanning, see Chapter 3.
- For details on scanning, including how to create a customized overlay, see the chapter titled SCANNING.

SEVERAL KEYS WITH TWO SWITCHES

For a two-switch user, programs requiring only a small number of keys can be nicely set up as a motor training or switch evaluation tool by means of redefined or customized Morse code. Imagine this:

<u>Child's Action</u>	<u>Result</u>
Press switch #1 for one signal	ears wiggle several times
Press switch #2 for one signal	tongue goes out three times
Press switch #1 for two signals	face smiles two times
Press switch #2 for two signals	face frowns two times
Press switch #1, then switch #2, for one signal each	face winks three times
Press switch #2, then switch #1, for one signal each	face cries three times
Press switch #1 then #2 then #1	character dances
Press switch #2 then #1 then #2	eyes cross two times

A child who can learn to do this is demonstrating a number of abilities: to press and release two switches, to count and sequence signals, and to remember codes and functions. Several reasons why you might teach codes to a young child are outlined by Chris Dumper and Daphne Neen in "Access to microcomputers by athetoid children," *Closing the Gap*, Vol. 6, No.1, Apr/May, 1987, p.14-15. They also describe a number of application programs they have found useful to use with redefined codes and young children. In the same edition of *Closing the Gap*, Kay Ahida gives

suggestions for teaching beginning codes to children and adults ("Morse code and augmentative communication," *Closing the Gap*, Vol. 6, No.1, Apr/May, 1987, p.24-25). Both of these articles refer to redefining or creating your own codes for early educational software — instructions for "Creating a Setup with Your Own Codes" follows next in this chapter.

Examples of redefined codes on your Menu Disk include:

Make Faces	code	Golden Edition Facemaker
Mel's Alex	code	Alex the Rabbit
Space Ret	code	Any program needing only SPACE and RETURN
DrinkRide	code	TAG Sampler

More Info

- For a demo using redefined codes with Alex the Rabbit, see "Demos," Chapter 3.
- For instructions on creating a setup with redefined codes, continue reading this chapter.
- For an overview of Morse code as an input method, see Chapter 3

Creating a Setup with Your Own Codes

The following tutorial will step you through creating a Morse code setup with your own codes for motor training or switch evaluation, using Alex the Rabbit as the example application software. If you do not want to create your own setup at this time, you may skip ahead to "... Mouse, Joystick, or Paddles" for more examples of one-switch, two-switch control with the AFC.

PLANNING THE SETUP

If you are not already familiar with the AFC Morse code methods, we suggest reading "What Is Morse Code?" in the MORSE CODE chapter, then using the tutorial which follows that section. You do not have to learn the standard codes presented in that tutorial, but the hands-on experience will give you a good feel for using *dits* and *dahs*. This will make it much easier to plan and create your own setup.

The first step in creating a setup with your own codes is to plan the Morse code overlay. The steps for planning an overlay are:

1. **Learn the application software** — so you know what keys and key combinations are needed to run the program.
2. **Decide what keys to include, what codes to use and how** (such as using *dit* to send SPACEBAR and *dah* to send RETURN).
3. **Decide the speech feedback** (optional) — what the speech synthesizer is to say after a code is sent — if you want this to be talking overlay.
4. **Decide if you want the remaining codes to be standard** (to send the same characters as in the standard overlay) **or null** (to send no characters at all).
5. **Plan levels** (if needed).

Each of these activities is described below.

Learning the Application Software

Before creating your own codes for a particular application program, it is important to **familiarize yourself completely with the application software**.

Please read the first part of Chapter 7 – "Planning the Setup" and "Learn the Application Software," including Figure 7-1 for Alex the Rabbit. When you reach the line of stars (***) in Chapter 7, return here for details about planning and creating a Morse code overlay.

Deciding What Keys to Include, What Codes to Use and How

Once you know what keys are required to operate the application program (as in Figure 7-1), you must decide which keys or key combinations to include in your Morse code overlay. Any code may be redefined as a **single character** (such as one ARROW) or a **string** of up to 100 characters (such as three ARROWS or a whole name). Special characters, such as ESC or RETURN

or OPEN-APPLE may be part of the string. The important factor here is that the application program do what you want it to do when the code is sent.

Let's say for our Alex setup we want to include the four ARROW keys plus the RETURN key. Each will be a separate code — a total of five codes.

Next, consider which codes you want the child to use (USER SENDS). In a motor training situation, you probably want to use the simplest codes possible, such as:

- and —
- and --
- and —•
- and —•—

In our Alex example, we only need five codes (for the five keys), so we'll select the five simplest codes:

-
-
-
-
-

Once you know the keys you want the COMPUTER TO RECEIVE and what codes you want the USER TO SEND, you'll need to decide which codes to define as which keys. A good rule of thumb is: the keys which are needed the most frequently in the program should be the shortest and easiest codes.

Figure 15-1 shows a worksheet, where we have matched up the five simple codes we want the user to send (in the USER SENDS column) to the characters we want the computer to receive (in the COMPUTER RECEIVES column).

Figure 15-1. Worksheet for Customized Codes for Alex the Rabbit

Name of Program: Alex the Rabbit (by Apple)

Name of Setup: MC ALEX

Type of Overlay: Customized Morse code, with speech feedback

Level #: 1 of 1

Code to be Sent:	Redefined as:	User Hears	
USER SENDS	COMPUTER RECEIVES	SPEECH FEED- BACK (optional)	RESULT in Application
•	RIGHT ARROW	"Right"	Alex moves right
—	LEFT ARROW	"Left"	Alex moves left
••	UP ARROW	"Up"	Alex moves up
--	DOWN ARROW	"Down"	Alex moves down
•—	RETURN	(none)	Starts game or wiggles ears

If you've used the tutorial in the MORSE CODE chapter, you know that short codes where you hold down just one switch (all *dits* or all *dahs*) are easier to send than codes where you move between switches. So we selected the easiest codes (•, —, ••, and --) to be the four ARROW keys. If our child is successful with these, we can later show him or her how to send •— (RETURN) to start the game. Notice in Figure 15-1 that we have also filled in the RESULT we are expecting for each code in the application program (last column).

Deciding the Speech Feedback (optional)

If you want to use speech feedback with Morse code, you also need to plan what you want the speech synthesizer to say after a code is sent. (You must have one of the speech synthesizers described in Chapter 3.) If you do not create this overlay as a talking overlay, you will not have the option for speech feedback.

The SPEECH FEEDBACK can be the same as what the COMPUTER RECEIVES (such as the name of a letter or number) or can be completely different. Notice in the SPEECH FEEDBACK column of Figure 15-1 that we want the UP-ARROW code to say "up," not "up arrow." We could also try having it say "jump up, Alex."

Deciding If You Want the Remaining Codes to be Standard or Null

When you create a setup with your own codes, you can choose to create either a redefined standard overlay or a customized overlay. Any overlay can have 1-10 levels of codes (see below), but in a beginning motor training situation, we will assume you are using only one level, Level 1.

In a **redefined standard overlay**, any codes you do not redefine will have the standard COMPUTER RECEIVES. For example, if you do not redefine • – • – to be something, it will be its usual something, which is RETURN. If the child accidentally sends • – • –, a RETURN will be sent to the application program, just as if the child had pressed the RETURN key. If speech feedback is active, the name of this code could also be spoken, which might cause confusion in a training situation.

In a **customized Morse code overlay**, any codes you do not define are null. For example, if you do not define • – • – to be something, it won't be anything. If the child accidentally sends • – • –, the *dit-dah* tones will sound, but no result will occur in the software. In a talking overlay, null codes do not provide speech feedback.

A redefined overlay has advantages in situations where you might want to gradually teach the child some standard codes for control of the computer or for further operations in the same application program. A customized

overlay has advantages in a situation where pressing wrong keys produces negative results or enters parts of the program the child isn't ready for.

With Alex the Rabbit, pressing any non-ARROW key causes Alex to wiggle his ears and imply that he doesn't "understand" you. Some children enjoy watching Alex be perplexed. In this case, accidentally sending standard codes does not create a problem with the application software. If this is a talking overlay, however, you would probably prefer *not* to hear speech feedback for the accidental codes. For that reason, we'll plan this overlay to be a customized, rather than redefined overlay.

Notice in Figure 15-1 that we've given the setup a name, MC ALEX (for Morse code), and that we've designated the "type of overlay" as customized Morse code with speech feedback.

Planning Levels (if needed)

A Morse code overlay can have up to ten LEVELS of COMPUTER RECEIVES for each code. In the Alex example, we are only using one level, Level 1.

In most motor training situations, levels of codes are not necessary, but levels of codes can sometimes have advantages. For example, one overlay with increasingly larger code sets in several levels could be useful as a graduated training tool.

A general explanation of levels, and suggestions for how they can be used, is available in "Planning a Setup: Planning Levels," Chapter 7. All information there applies to Morse code — just think of "code" each time you see "item." If you're interested in levels, read that part of Chapter 7 until you reach the line of stars (***), then return to "Creating the Setup on Disk," on the next page.

Creating the Setup on Disk

Before creating a setup on disk, it's helpful to have a quick overview of the process:

Extended Menu → Construction Programs → Extended Menu
(ADD A SETUP) (CREATE, SAVE, QUIT) (LOAD and use setup)

First you select ADD A SETUP from the bottom of the Extended Menu. This takes you to the setup Constructions Programs — you select a method and create an overlay. When done, you SAVE the setup on disk, then QUIT. Selecting QUIT takes you back to the Extended Menu, where you can LOAD the setup in the usual way and use it with an application.

Each screen and each step is described in detail in "Creating the Setup on Disk," Chapter 7. The only variations relating to Morse code are:

- The screen will use the word "code," rather than "item," eg.
"Indicate code user sends," rather than "Indicate item user selects."
- To "indicate code," you can:
 - use switches connected to the I/O box
 - use the COMMAND/OPEN-APPLE and OPTION/SOLID-APPLE keys
 - use the PERIOD on the Apple keyboard for *dit* and the COMMA, SLASH, or HYPHEN for *dah*

SUMMARY WITH "MC ALEX" EXAMPLE

Quick steps for creating a setup are given below. Instructions for the MC Alex example are in small italics — you'll need to have your worksheet (Figure 15-1) available to work from. For more detailed instructions without the MC Alex example, use "Creating the Setup on Disk" in Chapter 7. (The step numbers below and in Chapter 7 are the same. A step marked "b" here is unique to Morse code.)

Getting Started

1. Boot the Menu Disk. Press '9' and select ADD A NEW SETUP from the bottom of the Extended Menu.

2. From the list of input methods, select MORSE CODE.

3. Enter a TITLE.

For the Alex example, enter the title from the worksheet, "MC Alex."

4. Select the TYPE OF OVERLAY: customized, standard, or redefined standard.

For MC Alex, select CUSTOMIZED.

5. Select your SPEECH-FEEDBACK choice.

5b. Select a MORSE CODE METHOD and RATE.

For MC Alex, select one of the 2-switch methods.

6. When the CREATE OVERLAY MAIN MENU appears, you can begin defining codes in any level of the overlay.

- To work with Level 1, select WORK WITH OVERLAY.
- To work with another level, select USE LEVELS, then select CHANGE LEVELS.
- When you have finished the overlay, you will select TEST/SAVE/QUIT.

To begin the Alex overlay, select WORK WITH OVERLAY. (We will not be using multiple levels.)

7. A prompt to turn on your AFC may appear.

Basic Steps

You are now ready to begin defining codes. The basic steps for each code will be (don't do this yet):

- (1) Indicate code user sends.
- (2) Enter characters computer receives.
- (3) Enter speech feedback user hears (if you opted for speech feedback).

(4) When you have programmed the overlay, select TEST/SAVE/QUIT and SAVE your work to disk.

8. To INDICATE CODE USER SENDS, you can use switches connected to the I/O box or certain keys on the Apple keyboard:

Dit

switch #1
OPEN-APPLE
PERIOD

Dah

switch #2
OPTION/SOLID-APPLE
COMMA, SLASH, or HYPHEN

If you use switches or the APPLE keys, you will be sending code, just as the user will send it. This will give you a feel for the timing involved. (You can change the rate later.)

If you use the PERIOD key to indicate *dits* and the COMMA, SLASH, or HYPHEN key to indicate *dahs*, no timing is involved: the signals will appear on the screen as PERIODS for *dits* and HYPHENS for *dahs*. When the signal is complete, press RETURN.

For Alex, enter the first code on your worksheet, the single dit.

9. The screen changes to show the code you sent in brackets <.>.

For Alex, this should be <.>

To ENTER CHARACTERS COMPUTER RECEIVES, press the keys for the character or characters you want the computer to receive when that code is sent.

CAUTION: In most cases, you can directly enter the characters you want in COMPUTER RECEIVES. Special considerations, however, are: upper versus lower case and "special" characters such as LEFT ARROW, RIGHT ARROW, RETURN, or ESC. *To enter "special" characters, press ESC when the screen shows "Enter characters computer receives," then select the character you want from the special-character window.* For help or a listing of special characters, see Chapter 7, step 9.

For Alex, for the code <.>, we want the computer to receive RIGHT ARROW. To enter the RIGHT ARROW, press ESC, then select RIGHT ARROW from the special-character window.

You will also need to press ESC to enter LEFT ARROW and RETURN. You do not need to press ESC to enter UP ARROW and DOWN ARROW, since these are not "special" characters.

10. If you selected a speech synthesizer, the screen will show **ENTER SPEECH FEEDBACK USER HEARS**. For details, see Chapter 7, step 10.

For Alex, enter the speech feedback as shown in the SPEECH FEEDBACK column of your worksheet. For keys like the ARROWS and RETURN, when the screen shows "(same)" for speech feedback, this really means "none." So to get "none" for RETURN, you can just leave it as "(same)".

11. When the screen changes, you can press SPACEBAR to hear the speech again. Your choices are at the bottom of the screen. If everything is as you want it, just press return to **PROCEED TO NEXT CODE**.
12. Repeat steps 8-11 to **PROGRAM EACH CODE** you want to define. The following information is available in Chapter 7:

- | | |
|---------------------------------------|------------------------|
| 9. Enter characters computer receives | 17. Test it! |
| 10. Enter speech feedback user hears | 18. Change method/rate |
| 13. Changing or deleting entries | 19. Continue creating |
| 14. Listing contents | 20. Quitting |
| 15. Free memory | 21. Multiple levels |
| 16. Saving your work | |

Test/Save/Quit

To use the new setup, you must first **SAVE** it on disk. In fact, it is a good idea to save your work fairly often (such as every 10 minutes), even if you are not done. To save the setup you are working on, **follow the prompts on the screen to return to the Create Overlay Main Menu**. From the Create Overlay Main Menu, select **TEST/SAVE/QUIT**, then select **SAVE TO DISK**.

You can also select **TEST IT!** from the Test/Save/Quit choices, to test your setup in a Test Run window. (For details, see Chapter 7.)

To use the setup with your application software, you must first return to the Extended Menu. The safest way to do this is to select **QUIT** from the Test/Save/Quit choices, then select **EXIT TO EXTENDED MENU**.

Using or Changing the Setup

When you return to the Extended Menu, the new setup will be at the end of the menu. Your options include:

- Completing the Description window for this setup: press RETURN to bring up the Choices window, then select MAKE CHANGES ... DESCRIPTION.
- Trying out the setup with your application program: press RETURN to bring up the Choices window, then select LOAD THIS SETUP.
- Making changes in method, rate, overlay, or special options: press RETURN to bring up the Choices window, then select MAKE CHANGES ... then select the part of the setup you want to change.
- Moving the setup to any location on the Extended Menu, including the fixed Quick-Start Menu: highlight the setup, press CONTROL-R, then use ARROWS to move the setup.

See Chapter 6 for help with any of these options.

IF THE SOFTWARE REQUIRES A MOUSE, JOYSTICK, OR PADDLES

Some application software is designed to be run by a pointing device, such as a mouse, joystick, or paddles. The AFC offers a number of tools to handle such programs. (See Chapters 18-19.) In their full glory, these tools make it possible to create highly "intelligent" setups for particular programs, which can make it quite simple to use the programs with one or two switches. The Extended Menu contains several examples of such intelligent setups:

- The EDMARK RDG setup makes it possible to use the joystick-based Edmark Reading Program through a single switch. The setup has the effect of moving the joystick slowly back and forth automatically, thus converting the program into a scanning program. You make a selection by pressing the switch.
- The EXPLORE.S setup makes it possible to run Explore-a-Story (by Wm. K. Bradford Publishing Co.) by emulating the mouse with a single switch. A rotating arrow is used to move the mouse pointer up, down, left, or right as the switch is held down. Alternately, if you set the special option of ROTATING METHOD = 1, the switch will start and stop the mouse pointer movement, and doesn't need to be held down. (See Chapter 18.)

If these or other ready-made setups meet your needs, great! If not, you may wish to create your own. On the other hand, before you get too involved in doing this, you might consider this: the function of a setup is to give the AFC a way to be a reasonably intelligent helper for someone using the computer independently. If independence is not an immediate concern, an able-bodied human helper can be much more intelligent than any setup! (For examples, see "Motor Training ... Moving the Mouse (or Joystick)" later in this chapter.)

CREATIVE SOLUTIONS (OR CLEVER TRICKS)

So far, you have seen that the first step in "setting up" the AFC with your application software is to learn how the software is *supposed* to be run:

- If the software is designed for switch input (it will say "press a switch"), all you need to do is use the NORMAL or SW INPUT setup. These setups use the AFC normal-input method.
- If the software is designed to be run by pressing keys on the Apple keyboard, you can use AFC scanning, redefined or customized Morse code, an expanded keyboard, or the multiple switch box method. You may want to create a setup with an overlay customized to your application program. (An example of four-item input with a multiple switch box is provided later in this chapter.)
- If the software is designed to be run with a mouse, joystick, or paddles, you may be able to use AFC mouse/joystick emulation. (For details, see Chapters 18-19.)

These are the basic approaches. Considerable variation and creativity is possible within these approaches. Sometimes, you can even manage tricks which allow you to use your application software in ways which the writer of the software never intended! Once you are familiar with the AFC and creating your own setups, you can approach new software with (1) how is it *supposed* to be used, (2) how do *I* want to use it, and (3) what features of the AFC will help me accomplish my idea.

In the rest of this chapter, we'd like to give you several examples of "creative solutions" and "clever tricks" involving the AFC. Some of these examples are hypothetical, but many are "real," that is, based on experiences shared with us by people using the AFC for their students and children.

Group Interaction

The problem: Children learn from and with each other, but often children with physical disabilities are limited in their interaction with others, because they simply can't "do" the same things as easily, as quickly, or at all.

Sometimes, however, we can set up computer activities where two or more people explore an activity together.

MARK: RED SWITCH, BLUE SWITCH

Mark is one of four preschool children with speech and language delays. He can press a switch fairly easily, but he has had trouble learning color names. The other three children are doing fairly well with color names but need more practice.

The children are grouped around the computer. A multiple switch box with four switches (one for each child) is attached to the AFC I/O box. Each child's switch is made of or marked with a different color: red, blue, yellow, and green. The teacher loads her MSB setup and her application program, Early Learning I Colors (by Marblesoft). A female voice (the Echo speech synthesizer) "talks" to the children. The voice says, "Find red." Mark has the red switch, but he's not sure it's red. The other children check their own switches, then look around. Mark looks around — everyone is looking at him and nodding. He presses his switch. The voice says, "Yes, that's red" and shows a matching red square. If AFC speech feedback is active, Mark's switch, when he pressed it, would also say "red" in a male voice. The female voice goes on to ask another color — and another child gets a chance to respond.

KRIS AND ERIN: 1-SWITCH, 1-SWITCH

Kris and Erin both have severe cerebral palsy and very limited speech. Kris has been using a foot switch with the Up Down setup to operate Alex the Rabbit. Erin has been using a head switch. Both use the same scanning method (step scanning) at the rate of 5. Their therapist decides to let them try using it together — she plugs Kris' switch into jack #1 and Erin's into jack #2, then loads the setup and the Alex program. Either switch will bring up and operate the scanning array.

The girls begin by taking turns and moving the rabbit very seriously toward the carrot. Then Kris shows Erin a shortcut — she sends Alex up, he hits his head and falls down three steps. Erin is amazed. She tries sending Alex into the wall to see what he will do. This starts Kris laughing. Soon, both girls are engaged in sending each other eye signals as to what to try next and are helpless with laughter as they watch the results.

BOB: MY SWITCH, YOUR PADDLE

Bob and his dad are computer addicts. They like a good game, preferably one with shooting or flying, being chased, or being blown up. Often, these are paddle-based programs, where you turn a paddle back and forth to move an object, such as a rocket, and press the button, for example, to fire the shots. Bob cannot turn a paddle, but he is learning to control a single switch.

With AFC joystick/paddle emulation, Bob could operate such a program independently. However, Bob and his dad prefer to "team up" on the evil forces in a game. They use the SW INPUT setup (with an optional SLOW-DOWN), with Bob's switch connected to jack #1 — this is the fire button in many arcade programs. Bob's dad operates the paddle. Together, they dodge and shoot their way to victory!

CINDY: THE GROUP UNICORN

Cindy is a bright, very capable four-year-old with severe motor disabilities and minimal speech. The seven other four-year-olds in her story-time group have good motor control and good speech but poor listening skills and short attention spans. The teacher wants Cindy to be able to respond in the group in the same way as the other children. She wants to encourage her overall communication in a way that does not make Cindy "different." At the same time, while improving Cindy's communication skills, she must keep the attention of and improve the listening skills of the other seven children.

At story-time, all eight children are sitting in a semi-circle in front of the teacher. On her lap is a Unicorn Keyboard, with eight large colorful pictures of Sesame Street characters. The computer is somewhere behind her. She has previously loaded the Talking Word Board program and selected a vocabulary file she calls Sesame Street.

The teacher starts reading a story involving the Sesame Street characters. Every few sentences, she stops and asks the children a question, such as "Who wanted to go down the slide?" Several children raise their hands, including Cindy. The teacher chooses Davey and brings the Unicorn board to him. Davey looks over the pictures, says "Cookie Monster," and presses the picture. The speech synthesizer says "I'm Cookie Monster. I wuv cookies." The teacher says, "Cookie Monster — how many think it was Cookie Monster who wanted to go down the slide?" A few children raise their hands.

"How many think it was someone else?" A few hands go up, including Cindy's. The teacher calls on Cindy and brings the Unicorn to her. Cindy vocalizes an unintelligible sound. Her eyes are on the picture of Oscar. She works very hard to control her arm and hand, then presses the picture. (She does this more slowly than Davey, but the other children are watching to hear what the picture will say.) As Cindy presses, the voice says "I'm Oscar. I live in a garbage can." The teacher says, "How many think it was Oscar?" Several hands shoot up. "Let's read it again and see." (Of course, it was Oscar.)

Because everyone used the Unicorn, Cindy was not different. Because the Unicorn talked, all the children were interested in the activity.

Motor Training

Often the goal with the AFC is motor training — helping the young user to acquire the motor and perceptual skills needed for (eventual) full-keyboard access. The first steps can be small but important. Two examples follow.

WORKING HARD TO PRESS AND RELEASE

Matthew, age 10, has severe quadriplegic cerebral palsy. He cannot talk, cannot clearly indicate yes/no, and can barely, with a great deal of effort, move his hand to activate a switch. His therapist wants a way to work on switch control and to improve communication. His mother suggests he would love software with Peanuts characters. The therapist has several good motor-training programs, but none of them have Peanuts characters. She does have Charlie Brown's ABC's, which is a keyboard-input program by Random House.

The problem: Converting a keyboard-input program with 26 interesting selections to a press-and-release motor training game. Matthew is not ready for the timing involved in scanning or codes.

The solution: First, his therapist thoroughly studies the Charlie Brown's ABC's program. She finds that one keypress, such as 'B,' brings up the letter with a picture (such as 'B' and 'bat'). Then you must press the same key again to get a lively, animated, musical graphic. You can repeat the animation by pressing the SPACE key. She realizes that all she really needs is a way for

Matthew's switch to send the SPACE key. She decides to use the SPACE RET multiple switch box setup — she can plug Matthew's switch into jack #1 on the I/O box. With the SPACE RET MSB setup, pressing this switch will send SPACE to the application program.

When she works with Matthew, she presses a letter, such as 'A', two times to get the animated musical graphic. If Matthew likes the animation and wants to do it himself, he presses his switch, which sends SPACE. He can repeat the animation as often as he wants by pressing his switch. When he is done exploring this graphic, he lets his therapist know (by eye movement or body language), and she presses a new letter.

Eventually, they can use this type of activity to work on ways Matthew can let her know more clearly what he wants, such as a clearer yes/no. Later, she can make pictures of the characters Matthew likes the most and set these up as a mini-communication board, so he can use his eyes to point to the picture he wants next. In this way, she is helping him improve both his motor control (with the switch) and his social control (clearer interaction with her in expressing what he wants).

MOVING THE MOUSE (OR JOYSTICK)

Jessie, age 4, is very motivated by Explore-a-Story. She can press and release a switch fairly well but lacks the motor control to use the rotating arrow in the EXPLORE.S setup.

The problem: Converting a mouse- (or joystick-) based program to a simple press-to-select program. Jessie is not ready for the choices involved in mouse/joystick emulation.

The solution: Instead of using the EXPLORE.S setup, use the SW INPUT setup. Connect one switch to jack #2 on the I/O box. Switch #2 = OPTION/SOLID-APPLE, which Explore-a-Story will accept in place of the mouse button to select and drop items, etc. Let Jessie operate the switch while *you* operate the mouse — this provides an excellent vehicle for switch training, social interaction, and exploration of the program. It gives Jessie a way to pick up and drop creatures which you move around with the mouse. Or, if you position the mouse pointer on the next-page button, she can select new scenes by pressing the switch.

Essentially the same approach can be taken with the Sesame Street® Crayon by Polarware. With this program, you move the mouse pointer and click the button or press RETURN to change the color of the crayon or to color in part of the picture. Use the SPACE RET MSB setup, with one switch connected to jack #2. This will send RETURN when the switch is pressed. Again, the idea is that *you* move the pointer (using the mouse) and Jessie makes a selection by pressing the switch. The important note here is that you move the pointer in a slow, regular fashion, through choices of colors, objects, etc. — *you* become the scanning setup — giving Jessie the power and freedom to choose her own colors and/or color in whatever parts of the picture she chooses. By becoming her intelligent setup for this program, you are helping her learn how to interact with a moving pointer and preparing her for the next stage of switch control.

Software Perplexities

Some application programs may not seem immediately amenable to working the way you want them to with the AFC. This section will describe a few such challenges and some possible solutions.

MULTIPLE SPACES THEN RETURN

A teacher has been using the "build" program in Facemaker, where the child uses SPACE and RETURN to build a face. She uses one of the SPACE RET setups. (It could be scanning, Morse code, multiple switch box, or expanded keyboard.) This works well, but it is tiring for the child to continually select SPACE, SPACE, SPACE, SPACE, to move Facemaker's highlight through the choices involved, then finally select RETURN.

The problem: Finding a way the child can select SPACE and hold down the switch so that the highlight on the screen continues to move through the choices, rather than having to select one SPACE at a time.

The solution: The teacher changes the overlay in her setup so that the character for SPACE becomes a SPACE followed by AFC REPEAT. When the child selects SPACE, the AFC will send a SPACE then enter REPEAT mode — as long as the switch is held down, the SPACE will be repeated. Then the child can release the switch and select RETURN. This solution works with any AFC input method — scanning, Morse code, multiple switch box, or expanded

keyboard. With scanning, the special option of REPEAT METHOD provides two different ways of using the switch to control the repeat. (For information on AFC REPEAT, see the "Using ..." section of the chapter for your input method. To edit an overlay, see "Make Changes ... Overlay," Chapter 6 or the "Creating ..." section of the chapter for your input method.)

TOO MANY ITEMS

Jamie uses two switches well in a SPACE RETURN MSB setup, where switch #1 = SPACE and switch #2 = RETURN. Her father has picked out new program that calls for three keys: LEFT ARROW, RIGHT ARROW, and RETURN. He knows that scanning or codes or using three switches are too complicated for Jamie right now, but he also knows she would really like this new program.

The problem: Reducing the number of items needed in this overlay.

Possible solutions: Examine the program.

- Do you really *need* all three keys? Often you can run this type of program with just RIGHT ARROW and RETURN.
- Does the program also work with paddles? If so, two-switch paddle emulation may be a possibility (see example with Stickybear Opposites, below).
- Could this be a shared activity, where Jamie handles LEFT ARROW and RIGHT ARROW, and her father handles RETURN (or vice-versa)?

STICKYBEAR OPPOSITES

Sidney, age 2, is fascinated by Stickybear® Opposites (by Weekly Reader Family Software). In this program, an animated graphic appears. LEFT ARROW and RIGHT ARROW will change the graphic back and forth between opposites, and SPACE will bring up a whole new picture.

From various examples in this chapter, you know you could set this up for a switch-user in several ways: scanning, Morse code, multiple switch box, or expanded keyboard could all be customized for the three items: LEFT ARROW, RIGHT ARROW, SPACE.

With Stickybear Opposites, however, the child never knows whether LEFT ARROW or RIGHT ARROW will bring up the opposite. If, for example, the bear is ON the box and you press RIGHT ARROW, nothing will happen. To get the bear OFF, you must press LEFT ARROW. For a child who is learning cause-and-effect or is just learning to control a switch, this can be confusing or discouraging. Sidney was quite perplexed.

The problem: How to make the switch bring up the opposite graphic with no trial and error involved.

The solution: Stickybear Opposites also works with paddles: you turn the paddle left or right to bring up the opposite graphic (as if you were pressing the LEFT- and RIGHT-ARROW keys), and you press the paddle button to bring up a new picture. With AFC paddle emulation, you can use two switches in place of the paddle.

Load the SB OPPOSIT setup, then boot Stickybear Opposites. Select 'P' in the Stickybear program, as if you were going to use paddles. With the SB Opposite setup in effect, pressing switch #1 will bring up a new picture, and switch #2 will always flip the picture to its opposite — no guessing of LEFT or RIGHT ARROW is involved.

If the child can only use one switch, two-switch Stickybear Opposites can be a very interesting shared activity with two people interacting and taking turns, each with one switch.

SCAN LINE HIDES IMPORTANT CHARACTERS

Michael has been learning to use scanning. His school buys a new program. When his therapist tries it with scanning, however, she finds that when the AFC scanning array is on the screen, it covers up an important line in the program.

The problem: How to avoid covering up those characters.

Possible solutions:

- Use the special option of SCAN LINE to move the scan line to a different location on the screen. (See the SCANNING chapter.)
- Set things up so the array does not stay on the screen indefinitely.
 - Avoid reg.scan (ongoing) — use any other scanning method so the array will disappear after a selection is made.
 - Select Make Changes ... Overlay. From the array work menu, set the WHAT NEXT? option in your array to Quit (rather than Start over) if no selection is made. If you want the cursor to go through the array twice, add a second array identical to the first. Have array #1 branch automatically to array #2 if no selection is made, then have #2 quit if no selection is made. (See the "Creating ..." section of the SCANNING chapter.)
- Try using an approach other than scanning, such as redefined or customized Morse code, joystick/paddle emulation, or the multiple switch box method. These can work as well or better than scanning in some situations.

Time Savers

No matter what your situation, time is valuable. Here are some time-saving tips.

STORING A MESSAGE

A parent wants to get up and running with a particular part of a program right away, without the slow process of getting to that part. For example, with Facemaker, she wants to get quickly into the 'program' portion, without having to build a face first. Or with a word processor, she wants to get the child immediately to writing text in a new file without having to set up the new file each time.

The solution: First, she makes a careful list of all the keypresses needed to get to where she want to be. With Facemaker, this involves a few Y's or N's, then numerous SPACES and RETURN to build a face, then the number 2 to enter the part of Facemaker where you make the face cry, wink, frown, etc.

When her list is complete, she creates a message with this string of characters which she can execute as soon as the application disk boots. This could be a MACRO which she creates while running the program (you would use AFC.MACRO + CODE NAME to send the message — see Chapter 17) or this could be a string which she creates as an item in the overlay itself.

For an example of a string within an overlay, load the MAKE FACES code (Morse code) setup, then boot Golden Edition Facemaker. As soon as Facemaker boots, use switch #2 or the OPTION/SOLID-APPLE key to send five *dahs* in a row. Then sit back and watch Facemaker build its own face. In this case, we defined five *dahs* in the overlay to send a specific string of characters which will build a particular face and bring you to the part of program where you make the face smile, wink, cry, etc. You don't have to use the five *dahs*, of course — you can still choose to create your own face in the usual way.

For information on creating a setup with your own overlay, see the "Creating ..." section of the chapter for your input method.

CHANGING SETUPS QUICKLY

Four children in one classroom use the same program, but they use different methods, rates, and overlays. The teacher would like a group activity with this software — all four children taking turns — but this seems impractical, since four different AFC setups are needed.

The problem: Changing setups quickly within one application program.

The solution: The teacher can use CONTROL-R to move all four setups to the Quick-Start Menu, such as:

AFC QUICK-START MENU

SETUPS AVAILABLE ON THIS CARD:

* NORMAL	NORMAL
* KEVIN	EXPANDED KBD
* SUSIE	STEP SCAN
* ANDY	MORSE 2-SW
* KATIE	ASSISTED KBD

When she begins the activity, she selects one setup to start with (such as SUSIE), then loads the application program. Once the application program is loaded, she can use CONTROL-A 4 at any time to change between setups without losing the application program. (See Chapter 4 for more information on the Quick-Start Menu and CONTROL-A functions)

NOTE: If you need to connect or disconnect cables while running the application program, make sure the disk drive is not running, then turn the AFC OFF before connecting or disconnecting cables. Then turn it back ON.

PERSONAL FACTORS

With any AFC user, factors will come into play which are unique to that user. For example:

- Amy could use scanning, but she is unable to read the small AFC scanning characters.
- Bill's therapist is unable to find a rate in regular scanning which works for him. The cursor is always too fast or too slow.
- Joey frequently triggers his switch or keyboard accidentally, getting results which he doesn't want.
- Cathy can press a switch repeatedly, but she doesn't understand what to do when a cursor is moving.

Such factors as method and rate, the particular input device, hearing and vision, positioning, and motor learning can influence the successful use of the AFC by any user, whether child or adult. The next chapter, **FACTORS AND RESOURCES**, attempts to outline some of these factors and to suggest resources, in terms of people and readings, which you may find helpful.

CHAPTER 16

FACTORS AND RESOURCES

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CHAPTER 16

FACTORS AND RESOURCES

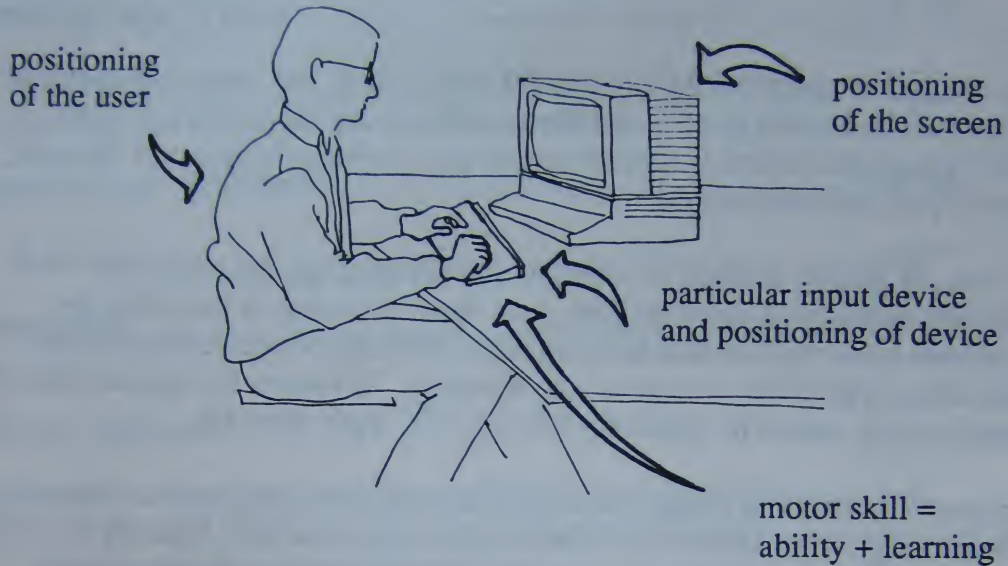
As the final chapter in PART II: INPUT METHODS, this chapter attempts to describe some of the factors which may influence the successful use of an AFC input method and to suggest resources, in terms of people and readings, which you may find helpful.

If you are getting yourself or someone else set up to use the computer through an alternate input method, your ideal, of course, is that using an alternate input method should be no more awkward or uncomfortable than ten-finger typing for an experienced secretary. In theory, the relative ease of touch typing should be attainable through AFC input methods.

In practice, however, the person who is learning an alternate input method is likely to encounter more frustrations than the person who is learning to touch-type. This is not because typing is less complex — ask anyone who remembers the hours of practice! — but because the factors which influence successful typing are well known and understood.

For example, factors such as correct sitting position, height of the keyboard, and placement of the computer screen are so well understood that they are taken for granted or are already built into office furniture. Other factors, such as correct wrist position and conceptual and motor learning are part of all typing courses. A glance at Figure 16-1 will bring some of these factors to mind.

Figure 16-1. Some Factors in Successful Use of an Input Device.



For the alternate-input user, on the other hand, many of these factors are not well known or understood. For this reason, this chapter calls attention to a number of factors which may have a strong bearing on the success or lack of success which a particular user may experience when using alternate input methods to run a computer via the AFC.

We wish to acknowledge two serious limitations to this listing, both of which are due to the broad range of individuals who may be using the AFC:

First, some factors will be listed which have no relevance to you. For example, "conceptual learning" is not a relevant factor if you are the adult business person described in the Introduction but clearly is a consideration if you are the teacher or parent of a young child.

Second, each factor is described only briefly and in general terms. For some users, particular factors deserve much more detailed discussion and evaluation, preferably by specialists in the areas involved. If you are the business person in the Introduction, you may wish assistance from a rehabilitation specialist in the selection of a switch. If you are a preschool teacher, you may need help from a language specialist in selecting appropriate application software. If you have severe cerebral palsy, you may need assistance from an occupational or physical therapist to determine positioning which allows reliable movement. In many situations, a team approach is helpful, where the experience and perspectives of each person can be shared.

If difficulties are encountered in the successful use of a particular input method, the listing of factors and resources in this chapter may serve as a good starting point for further evaluation and exploration. If you have suggestions for changes or additions to this chapter, we would be happy to hear from you. (Please write or call Don Johnston Developmental Equipment, Inc.)

MOTOR ABILITY

When you watch a good touch-typist, you see fingers rapidly and accurately flying. This *motor skill*, acquired through learning and practice, began with *motor ability* — in this case, the ability to use ten separate fingers to reach and push any and all of the keys on the keyboard. This motor ability is of prime importance in using touch-typing as an input method. Similarly, the underlying motor abilities of the AFC user are of prime importance in the selection and successful use of an alternate input method.

In selecting an AFC input method, the initial question becomes: what movement or movements can best be used to access the computer? This may be a matter of asking a few questions or of ongoing, detailed evaluation and training. The critical issue is determining **what movements are reliable** (can be voluntarily activated, repeated, and released as needed) **and efficient** (are not laboriously slow, do not cause undue fatigue, and are not counterproductive to your health or your therapy program).

If you have severe quadriplegic athetoid cerebral palsy, for example, you may have a great deal of movement, with the

initial question becoming which movements can be most easily and accurately controlled.

If you have a high-level spinal-cord injury, on the other hand, you may be limited to movements above the neck — these movements are usually reliable and easily identified. The initial question, in this case, may be which movements are the most comfortable and least fatiguing.

TO CONTROL A KEYBOARD

In thinking of movements which might control the Apple keyboard or an expanded or miniature keyboard, some considerations are:

- **Your functional range of movement** — with the proposed keyboard in front of you, which areas can you reach easily and which can you reach with only slight difficulty? An expanded keyboard requires a larger range of movement, but you do not necessarily have to use all the keys. A miniature keyboard, of course, requires only a very small range of movement.
- **The size and spacing of the keys you can touch with ease** — this will be influenced by the body part or pointer you use. For example, you may be able to point with a finger or a wand to 1/2 inch squares, or you may need larger blocks of keys if you are pointing with the heel of your hand, a fist, etc. With an expanded keyboard, the keys are larger. If they are not large enough for you to be accurate, you may be able to group keys together to form larger blocks. With a miniature keyboard, you must be able to activate very small keys accurately, because the keys are very small with very little space between them.
- **The availability of a resting position** — you need a place to relax your "pointer" (hand or foot or wand) without triggering keys. (Even a rapid 10-finger typist puts the wrists down at some point!)
- **A means of avoiding accidental keypresses** — if accidentally triggering keys is a problem, it sometimes helps to place the keyboard at an angle (see "Positioning of the Input Device," below) and/or use a keyguard (see "Adaptations to the Keyboard," below).

TO CONTROL SWITCHES

If using a keyboard is impossible or laboriously slow or requires considerable physical effort, you should think about using one or more switches, instead. Almost any body part can be used to control a switch. In most situations, it is important to determine the most reliable and efficient movement, then select a switch appropriate to that body part and that movement.

In considering movements which you might use to control a switch, notice how reliably and easily you can use a certain movement to:

- activate or trigger a switch
- release the switch
- reactivate the switch
- not trigger the switch until needed (or when asked to wait)
- hold the switch closed for a desired time.

Your switch-control abilities will change depending not only on the movement involved but on your positioning, the switch itself, the position of the switch, and other such factors, outlined below.

RESOURCES

People: Occupational and physical therapists
Rehabilitation engineers

Readings: Burkhart, *Using Computers and Speech Synthesis to Facilitate Communicative Interaction with Young and/or Severely Handicapped Children* (1987)
Levin and Scherfenberg, *Selection and Use of Simple Technology in Home, School, Work, and Community Settings* (1987)
Wright and Nomura, *From Toys to Computers* (1985)

POSITIONING OF THE USER

A person must be positioned comfortably and with stability in order to perform refined motor tasks easily and reliably. How you are positioned can influence whether you have or don't have reliable movement; the range, accuracy, and quality of that movement; and how well that movement can be used to access a keyboard or control a switch. Changes in positioning can increase or decrease a person's motor control.

All positions in which you can access the computer and supports which you use in that positioning should be identified.

For example, if you are using the computer while sitting in a wheelchair, supports or restraints which provide stability and comfort should be identified. This might include the angle of incline for the back of the chair or the use of special supports for the feet, trunk, arms, neck, and so forth.

Note: Because positioning of the user can affect muscle tone and movement, consultation by an occupational and/or physical therapist may be appropriate.

RESOURCES

People: Occupational and physical therapists
Rehabilitation engineers
Specialized vendors

Readings: Burkhart, *Using Computers and Speech Synthesis to Facilitate Communicative Interaction with Young and/or Severely Handicapped Children* (1987)
Levin and Scherfenberg, *Selection and Use of Simple Technology in Home, School, Work, and Community Settings* (1987)
Wright and Nomura, *From Toys to Computers* (1985)

POSITIONING OF THE COMPUTER SCREEN

Most people work best with the computer screen **at or slightly below eye level**. Being able to look directly ahead at the screen, with your head tilted slightly forward is comfortable. Looking at a screen with your head turned to one side or tilting back is uncomfortable and can cause undesirable changes in muscle tone. Moving the screen up, down, left, right, and closer or farther away can make a significant difference in how well or how easily you use a keyboard or a switch.

RESOURCES

People: Occupational and physical therapists

THE INPUT DEVICE

The *input device* that you use — **the particular switch or keyboard** — may be important in how easily you can control it.

PARTICULAR KEYBOARDS

Factors to consider include how much pressure is needed to activate the keys; what the keys feel like when touched (tactile qualities); what sound the keys make when touched (auditory feedback); the size of the keys; the distance between the keys; how well the keyboard does what it is supposed to do (reliability); and how well it holds up to continued use (durability).

PARTICULAR SWITCHES

Factors to consider include the type of motion needed to activate the switch; how easily it responds (sensitivity); its size and shape; the materials and time needed to mount the switch in a secure position; the sound it makes when triggered (auditory feedback); how it feels when touched (tactile qualities); how it looks (attraction or distraction, social acceptance); how well it does what it is supposed to do (reliability); and how well it holds up to continued use (durability).

RESOURCES

People: Occupational and physical therapists
Rehabilitation engineers
Specialized vendors

Readings: Levin and Scherfenberg, *Selection and Use of Simple Technology in Home, School, Work, and Community Settings* (1987)
Wright and Nomura, *From Toys to Computers* (1985)

POSITIONING OF THE INPUT DEVICE

Where the keyboard or switch is located, the stability of its position, and what part of your body you use to touch it can influence how well the method works for you.

POSITIONING A KEYBOARD

The Apple keyboard or an expanded/miniature keyboard should be **positioned with the monitor behind it for easy viewing**. A keyboard can be positioned on your lap or laptray, on the floor, on a table, etc., in either a flat or tilted position. Small rubber feet located on the bottom of many keyboards will help keep the keyboard from sliding on a flat surface.

Many people find a keyboard easier to read and use if it is tilted toward them. Headwand users often find a 45 degree angle beneficial. Others may feel most comfortable with a lower degree of tilt.

A keyboard can be positioned on a heavy book stand, a podium stand, a commercial or home-built stand, or propped against books, etc. If the position of the keyboard is uncomfortable or if you unintentionally trigger the keys with your hand or arm, it is often helpful to begin by having someone place the keyboard at elbow level and raise, lower, or tilt it. It can also help to build up supports around the keyboard, or to recess the keyboard — you can then use the supports as a resting position or as a prop for stabilizing yourself for more controlled movement. (Read about "Adaptations to Keyboards," the next section in this chapter.)

Ideally, you'll want the keyboard positioned so that very little movement is needed to look from the screen to the keyboard and back to the screen. (Constantly moving your head up and down can cause strain and fatigue if the movement you must make is large.) A headwand user will need the keyboard placed high enough to access the center area without back fatigue.

POSITIONING SWITCHES

Switches must be positioned in such a way that you can easily reach, trigger, release and stay away from the switch. Once proper placement has been determined, the switch or switches should be mounted in a **stable position**. If a switch is not consistently in the same place, your accuracy with the switch will be reduced. Ideally, the switch should be **permanently mounted**, so you are not dependent on someone putting it in place whenever the computer is to be used. If this is not possible, the mounting for the switch should be permanent, so that the switch, when slipped in, will always be in the same place. The position of the switch should not interfere with your vision or with daily activities, such as eating. Mounting kits are often available from the switch manufacturers.

Note: Because the angle or positioning of the keyboard or switches may affect the posture and tone of the user, consultation by an occupational and/or physical therapist may be appropriate.

RESOURCES

People: Occupational and physical therapists
Rehabilitation engineers
Specialized vendors

Readings: Burkhart, *Using Computers and Speech Synthesis to Facilitate Communicative Interaction with Young and/or Severely Handicapped Children* (1987)
Levin and Scherfenberg, *Selection and Use of Simple Technology in Home, School, Work, and Community Settings* (1987)
Wright and Nomura, *From Toys to Computers* (1985)

ADAPTATIONS TO KEYBOARDS

Two adaptations are sometimes very useful with keyboards: these are *keyguards* and, for the Unicorn Model I Keyboard, a *dead-spot eliminator*.

A KEYGUARD is a sheet of thin, strong material, such as plastic, metal, masonite, or thick cardboard, which is placed over a keyboard, with holes or squares cut out, corresponding to the keys or blocks on the keyboard. The advantage of a keyguard is that you can rest your arm or foot or wand on the guard, then poke into the hole to trigger the key. A keyguard helps some people press one key at a time without accidentally triggering other keys. Keyguards can sometimes adversely affect your ability to release a key or block once it has been selected. Keyguards can be homemade or purchased. (See Manufacturers, Appendix C.)

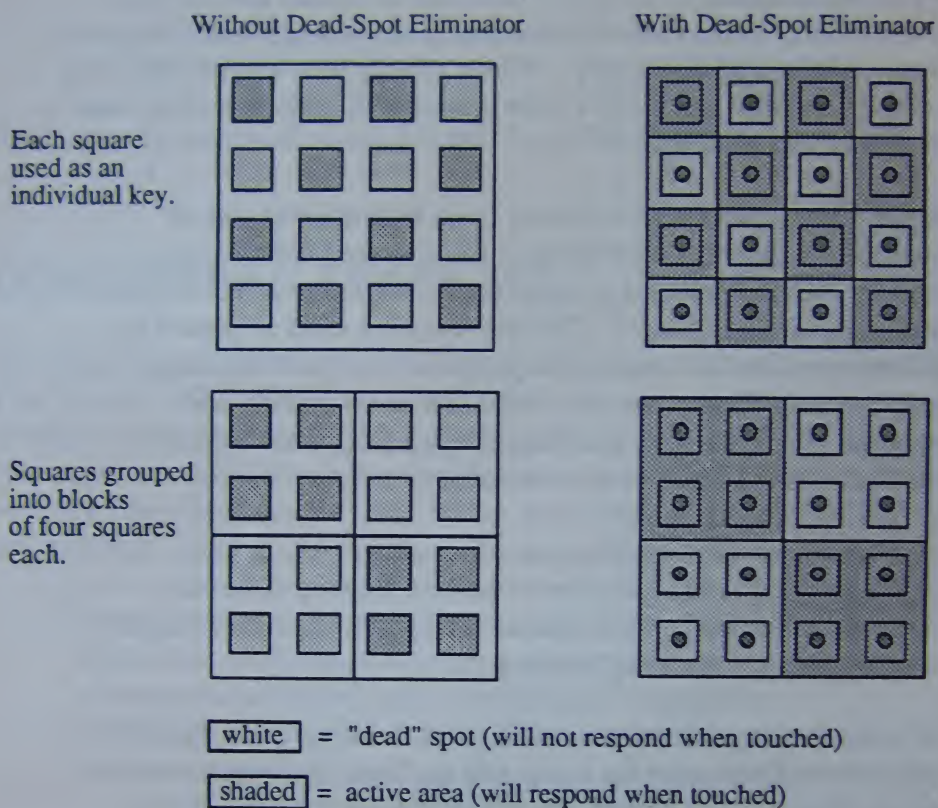
A DEAD-SPOT ELIMINATOR is a sheet of thin plastic with bumps or felt pieces laid out to fit the center of each Unicorn Model I key. You place this sheet on the Unicorn Model I Keyboard, beneath the paper overlay, so that each bump is on the center of a Unicorn keypad. The advantage of a dead-spot eliminator is that when squares on the Unicorn Model I are grouped into blocks, you can press anywhere within the block to activate that block. In the Unicorn Model I without a dead-spot eliminator, it is not necessarily true that touching any part of the block will activate the block. (See Figure 16-2.) Dead-spot eliminators may be home made or commercially produced. (See Manufacturers, Appendix C.) With the Unicorn Model II, a dead-spot eliminator is not needed, because there is virtually no dead space between the squares.

RESOURCES

People: Occupational and physical therapists
Rehabilitation engineers
Specialized vendors

Readings: Burkhart, *Using Computers and Speech Synthesis to Facilitate Communicative Interaction with Young and/or Severely Handicapped Children* (1987)
Wright and Nomura, *From Toys to Computers* (1985)

Figure 16-2. The Effect of a Dead-Spot Eliminator with the Unicorn Model I Keyboard



When using a dead-spot eliminator, formerly dead spots outside of the squares on the Unicorn Model I will respond as if the nearest square had been touched. The dead-spot eliminator is NOT needed with the Unicorn Model II.

THE INPUT METHOD, RATE, AND OVERLAY

A variety of AFC input methods are available for the person who can use a keyboard or one or more switches. (See Chapter 3.) The method, rate, and overlay you select should be based on your motor, visual, and auditory abilities and needs. In the case of developmentally younger users, cognitive abilities and needs will also apply. **Minor changes in the overlay, the rate, or the method can affect how successful you are with that method.** Examples follow.

If you have trouble with scanning or an expanded keyboard because the display is too small or too cluttered, try creating a simpler overlay, with large items on the keyboard or 20-column text in the scanning array. (For the scanning array to appear in 20-column size, the application program must use full-screen graphics.) A simpler overlay can decrease frustration and increase efficiency with some application programs. Speech feedback for the input method can also be helpful.

If an expanded keyboard is responding too quickly to your touch, printing letters you don't want, try slowing down the rate. Or, if you're having to spend a long time on a letter to get it to register, try speeding up the rate.

If you're having difficulty with two-switch Morse code, because you are thinking about the codes and can't get from one switch to the other quickly enough, try slowing down the rate. As you become more proficient, you can start increasing the rate without losing accuracy. If the *dits* and *dahs* feel slow and laborious, try speeding up the rate to see if that's easier.

If you're using regular scanning and, regardless of the rate, you find it difficult to hit the switch when the cursor is on the item you want, try another scanning method, such as step scanning, build up some skill with that, then try regular scanning again at a later time.

RESOURCES

People: Occupational and physical therapists
Speech/language pathologists
Rehabilitation engineers
Special educators
Specialized vendors

Readings: This manual — see Chapter 3 and the chapter for your method.

CONCEPTUAL LEARNING

To use any input method well, the user must first understand how it works. This is called **CONCEPTUAL LEARNING**. Some methods and some overlays are much more difficult to understand than others. For this reason, **the cognitive abilities of a developmentally younger user should be very carefully considered when selecting an input method and an overlay.**

For example, using a keyboard method or a multiple switch box will be less confusing to a young person than scanning. If scanning must be used, step scanning may be easier to understand than regular scanning, because step scanning is very similar to counting.

A standard overlay, which includes all the keys of the Apple keyboard, may confuse or overwhelm some users, due to the large number of choices available. A customized or redefined overlay may need to be created to address the specific needs of developmentally younger users.

CONCEPTUAL LEARNING: KEYBOARDS

The custom overlay possibilities of the AFC offer a great deal of flexibility in how a keyboard layout can be designed. If you are working with a developmentally younger user, receptive and expressive language skills and language processing abilities will be very important considerations in your custom keyboard layout. Your information about the user's abilities in these areas

will help determine the application programs you use, the number of items you put on the overlay, the symbols you use, and how they are arranged.

CONCEPTUAL LEARNING: SWITCHES

Using scanning or Morse code as an input method is, in and of itself, a more complex task than using a keyboard. The same considerations apply as with a keyboard (number of choices and how these are displayed), but additional factors apply as well.

Look carefully at exactly what the person needs to do with the switch. In regular scanning, for example, the user must press and release the switch, look for the desired item, then wait and watch the moving cursor until it is on that item, then press the switch again. A young user may be able to press a switch when someone says "press the switch now," but may not understand something like "when the light is on the group you want, press the switch again."

If the scanning or Morse code task is too complex, it often helps to "break it down" into simpler steps. For example, you might begin with a custom overlay which uses one-at-a-time scanning rather than group-item scanning or that has three groups, rather than five or six. Using a talking scanning overlay or Morse code with speech feedback can also simplify the task for some users. (See the chapters titled SCANNING and ONE SWITCH, TWO SWITCH ...)

RESOURCES

People: Speech/language pathologists
 Special educators
 Occupational therapists

Readings: This manual — see Chapter 3; the chapter for the method you're using; and the chapter titled ONE SWITCH, TWO SWITCH ...

MOTOR LEARNING

Motor learning refers to the process by which you learn to perform a complex action so well that your muscles function almost automatically, with little conscious thought. In other words, motor learning means learning certain motor patterns, as in typing or using an AFC input method. Understanding the task (conceptual learning) may take a few minutes — motor learning may take months or years. (Ask any touch typist!)

Motor learning progresses in stages: First, you learn to use the motor pattern (in this case, the input method) with focused attention for consistent accuracy. Second, with practice, you learn to use the method with increased speed. Third, eventually, you learn to use the method with little conscious thought on the motor task itself — this frees you to direct your attention to the application software.

The motor learning involved in using a keyboard is straightforward: learning the location of the keys, then learning to find and touch the keys with increased speed and less concentration. The motor learning involved in efficient scanning or Morse code may be more complex for some individuals, because timing and interaction with a moving cursor (visual or auditory) are involved.

SWITCHES

Aids to motor learning in scanning and Morse code will depend on the history and experiences of the user as well as on the input method being learned.

If you have had a severe motor impairment since birth, your previous motor experience may be limited, so **experiences to build up motor learning may be helpful**. Initial experiences should allow you to concentrate on the motor task (see later discussion on Application Software). Some degree of motivation is required for this kind of practice, so for young children it will be important that the training tasks be enjoyable.

For young children, a sequence of tasks for developing motor planning skills might include using a switch:

- (1) to control toys

- (2) to control simple switch-input software, such as Creature Antics, Motor Training Games, and Interaction Games
- (3) to use very simple scanning arrays with the AFC (see Chapter 15) or to use scanning-input software, such as The Rabbit Scanner, Catch the Cow, or Symbol Writer. (See Publishers, Appendix D.)

Once the user, whether child or adult, can use an AFC input method, such as scanning or Morse code, correctly, then **many, many repetitions (practice!) with the method may be needed to establish the motor pattern** so that the individual can do it more quickly and, eventually, can do it without focused attention. When the motor act is almost automatic, it can be used for complicated tasks, such as school work for the child or word or data processing for the adult.

RESOURCES

People: Occupational and physical therapists
Speech/language pathologists

Readings: Beukelman, Yorkston, and Dowden, *Communication Augmentation* (1985)
Burkhart, *Using Computers and Speech Synthesis to Facilitate Communicative Interaction with Young and/or Severely Handicapped Children* (1987)
Gierhart, *Motor Training Games Applications Guide* (1986)
Wright and Nomura, *From Toys to Computers* (1985)

HEARING AND VISION

Difficulties in using the computer may relate to (1) your ability to hear and discriminate the sounds which are produced by the switch or keyboard, computer, and/or speech synthesizer and (2) your ability to see both the monitor and the visual display for the input method.

The computer monitor and application software should be selected with the visual abilities of the user in mind. Larger monitors or screen magnifiers can often be helpful.

The sounds and speech synthesis coming from the computer may be useful if they are heard and understood. Difficulties can result, however, if these sounds cannot be heard or if they are loud, annoying, or confusing.

The AFC special option of CLICK FEEDBACK lets you add or remove an auditory click as feedback for pressing the keyboard or switch. (See Chapter 5.)

Earphones may often be used with the speech synthesizer or the computer speaker. If the tones in an Apple IIGS are too loud or too soft, use the Control Panel Program to change the volume of the speaker (see your Apple IIGS Owner's Guide).

If startle reactions occur, notice if these are reduced as the sounds become familiar. (If startle reactions continue, consultation by an occupational and/or physical therapist may be appropriate.)

HEARING AND VISION: KEYBOARDS

Most keyboards produce a click or a computer "beep" when a key or block is pressed. For many people, this is a guide as to whether the computer has registered their selection. If you cannot hear or make sense of this "beep," using the keyboard can be confusing.

For a person with visual impairments, for a young child, or for anyone who is an auditory learner, the option for *AFC speech feedback* from the keyboard may be useful. With this option, a speech synthesizer speaks the name of the key or square as soon as it is pressed. This may be used with the Apple keyboard, with an expanded/miniature keyboard, or with switches connected to a multiple switch box. (See Chapter 3 and the chapter for your method.)

If you can accurately see only one portion of the keyboard, only the keys or squares in that area should be used. If you cannot distinguish fine lines or small symbols, the symbols used on the keyboard should be thicker and larger. Visual memory, visual scanning, and visual perception should also influence the number of items you display on the keyboard and the size and the visual complexity of the pictures/symbols you use. Tactile cues can be helpful, such as different textures to distinguish different areas or keys.

Visual considerations will be very important in deciding the arrangement of keys or squares with an expanded keyboard.

HEARING AND VISION: SWITCHES

Most, but not all, switches produce a click of some type when pressed. This is often an important guide as to whether or not the switch has been activated. With the AFC scanning and Morse code methods, computer "beeps" or *dits* and *dahs* also provide feedback regarding switch closure. Several switch closures are often needed to produce one letter, which means listening to a lot of clicks, or "beeps," or *dits* and *dahs*. Difficulty in hearing or discriminating these sounds may reduce your success with the method.

Morse code has no visual display — you may send characters to the computer by relying only on the *dits* and *dahs* that you hear. For this reason, as well as for its efficiency, Morse code has proven to be an ideal method for some people with visual as well as motor impairments. *AFC speech feedback* with Morse code may be helpful, especially when first learning the codes (see Chapter 3 and the Morse code chapter.) Morse code can also be used by people with hearing impairments, provided you can use switches well enough to learn the codes by rhythm, rather than by sound.

With AFC scanning methods, you must be able to see the letters on the scanning overlay and to track the cursor as it moves across these items. If it is difficult to do this, one or a combination of the following may be helpful:

Customized overlays. The "standard" scanning overlays, with compact groups of letters, may at first be visually confusing. Training with overlays which contain fewer choices, such as clearly spaced single letters or whole words, may prove helpful.

A talking overlay. The AFC speech feedback option allows you to create and use scanning overlays which talk: as the cursor moves across the overlay, the items are "read aloud" by a speech synthesizer. Several example talking overlays are included on the AFC Menu Disk. (See Chapter 3 and the chapter titled SCANNING.)

A large-sized overlay. You can increase the size of the AFC scanning characters to approximately one-half inch. For this to work, the application program must use full-screen graphics. Also, each array should be limited to 20 characters, because only 20 characters will fit at one time. (See the chapter titled SCANNING.)

A new position for the overlay. The standard position of the scan line is the second-to-bottom line of the screen, but you can move this higher or lower on the screen. (See the chapter titled SCANNING.)

Added graphic cues. A strip of stiff paper may be taped onto the monitor, just below the scanning array. The paper may have pictures, drawings, stickers, or enlarged letters, lined up to be exactly under the scanning array when it appears. (A strip which matches the array on one monitor may need to be changed if a different monitor is used.)

A larger monitor. By itself, or in combination with any of the above, a larger screen for your computer can sometimes make a difference.

A screen magnifier. A TV screen magnifier, such as the one available from Hanover House, can significantly enlarge the image from the computer monitor. (See Appendix C.)

A second computer screen. The Elementary MOD Keyboard System, by TASH, allows creation of large-sized row-column scanning overlays on a VIC-20 computer monitor to transparently operate keyboard-input software on a second computer, such as the Apple II. If you already have an Adaptive Firmware Card, you would need to add a VIC-20 computer, a TV or monitor (preferably color), a switch adapter for the VIC-20, and a special cable from the VIC-20 to the AFC I/O box. This system was developed by the National Research Foundation of Canada and the Hugh MacMillan Medical Centre, Toronto. For more information, contact TASH (see Appendix C) or your local TASH dealer.

APPLICATION SOFTWARE

The software you are using has an impact on how well and how easily you use the computer and the AFC input method. If you are just learning an input method, or just training someone to use a method, the application software should be motivating but not complex in and of itself. No one would practice typing by using a doctoral dissertation as the first keyboarding experience!

An adult learning to type would first copy words, phrases, and paragraphs from a book. When the method (typing) was comfortable, the new typist might continue copying simple documents to pick up speed and efficiency. Only when the method was well in hand would the typist begin to type papers of difficulty or personal importance.

The same principles apply for a child — the first use of a new input method should not be taking a test or doing homework! (See "Motor Learning," earlier in this chapter.)

RESOURCES

People: Special Educator
Computer Specialist

READINGS

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CHAPTER 17

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CHAPTER 17

USING TEXT MACROS

This chapter will provide detailed information on AFC TEXT MACROS, including the Instant Message and Macro Manager programs. Much of this information applies to MOUSE/JOYSTICK MACROS as well. Macros can be used with any AFC input method — we assume you are already familiar with your particular input method.

One of the enhancements the AFC offers is the ability to create and use macros within a setup. AFC macros are of two types: TEXT MACROS and MOUSE/JOYSTICK MACROS.

A TEXT MACRO can be very useful in saving keystrokes and speeding up command sequences when you are using the AFC in place of the Apple keyboard. It may contain a string of up to 100 characters, including special characters, such as RETURN, CONTROL, etc.

A MOUSE/JOYSTICK MACRO can save keystrokes and time when you are using the AFC in one of the mouse or joystick emulation modes. It may also contain a string of up to 100 characters, including special characters and mouse/joystick commands.

The two types of AFC macros are very similar. While this chapter is primarily concerned with TEXT MACROS, much of the information applies to MOUSE/JOYSTICK MACROS as well. (Mouse emulation will be discussed in Chapter 18, joystick emulation in Chapter 19, and advanced use of macros in Chapter 20.)

WHAT ARE "MACROS"?

The term "macro" comes from the Greek *makros*, for long. In English, it means *long, large, enlarged, or elongated*. In the context of computers, "macro" has come to mean a recorded sequence of characters and commands which you execute with a quick selection of some sort. The implication here is that the quick selection is *enlarged* into the recorded sequence.

With the AFC, *macro* means a string of characters which you, the user, have stored in the AFC's memory under a CODE NAME which you have selected. When you retrieve (or "play back") the AFC macro by sending its CODE NAME, the string of characters will function as keystrokes and/or keyboard or mouse/joystick commands.

In its simplest terms, a macro is a "message." If you choose CODE NAMES which are abbreviations of your messages, the AFC macro capability is a form of "abbreviation expansion," and may be used to accelerate your creation of text. For example, you might create a macro which contains your name and address for letter writing.

In more general terms, however, AFC macros give you a powerful means of creating shortcuts in your day-to-day use of the computer. For example, you could create macros for AppleWorks which include complex combinations of various AppleWorks commands such as cut and paste commands, APPLE-S (save), and APPLE-P (print).

For adventurous souls, the AFC macro capability contains what amounts to a rudimentary programming language, which will let you include "if – then" statements in your macros. This means that AFC macros may be used to do very complex and/or elegant things indeed! This will be described in Chapter 20, ADVANCED USE OF MACROS.

USING TEXT MACROS WITH AN APPLICATION

In this section, you will activate the MACROS special option in your preferred "S" or "T" setup and will retrieve and create macros while using the Text Demo program.

Getting Started

To use this section as a hands-on tutorial, you will need:

- An Adaptive Firmware Card, already installed
- Your copy of the AFC Menu Disk
- The Sample Application Software disk.
- Your input device (such as switches or an expanded/minature keyboard). You may use the OPEN-APPLE and OPTION/SOLID-APPLE keys as switches, if you prefer.
- Experience with the "S" or "T" setup for your input method. If you are not familiar with this setup, see the tutorial in the chapter for your input method.

***** CAUTION:** *Make sure the computer is OFF when connecting or disconnecting switches or cables. ****

If you want to use this demo through an AFC input method, rather than the Apple keyboard, please be sure your preferred AFC setup with full-access overlay is in the #1 position on the Extended Menu. Having your setup in the #1 position means that this setup is active when you use any of the programs on the Menu Disk. (See "Having Your Setup Active at Startup, " Chapter 6.)

Getting Ready to Use Macros

To use AFC macros with a setup:

- (1) the overlay must include the AFC.MACRO *character* and
- (2) the *special option* of AFC.MACROS must be on.

In this tutorial, we recommend using the "S" or "T" setup for your input method, but you could use any setup which has the AFC.MACRO character in the overlay.

If you want to use a setup other than the "S" or "T" setup, you should first check the macros capability for that setup: Bring up the Choices window, select Get More Information, then select Vital Statistics.

If the Vital Statistics window shows "macros capability" is YES, then the MACRO character is in the overlay and the option is on. If "macros capability" is OFF, then the MACRO character is in the overlay but the option is off. We'll be showing you how to turn it on, on the next page. If "macros capability" is NO, then the MACRO character is not in the overlay. For information about adding this character to an overlay, see "Adding Macros to Your Setup," at the end of this chapter.

LOCATE THE AFC.MACRO CHARACTER

The standard overlay in each "S" or "T" setup includes a standard AFC.MACRO character. The AFC.MACRO character for each standard overlay is listed below. If you are using the Apple keyboard, use the '\ ' key as the MACRO character.

<u>Standard Overlay</u>	<u>AFC.MACRO Character</u>
Assisted keyboard.....	' \ '
Expanded keyboard: Unicorn MESSAGE square in row 2	
TASH.....	' \ '
Morse code.....	•••---
Scanning.....	' \ ' in the alphabet array
ASCII input.....	ESC or CTRL-]

Note: When the MACROS option is on, if you are using the Apple keyboard, you may obtain the '\ character itself by pressing it twice. The same is true for other methods as well. For example, for ASCII, send ESC twice to get the ESC character itself.

When you create your own overlay, you can place or define this character however you wish. If an overlay does not include the MACRO character, you can add it by using the Make Changes ... Overlay window. (See "Adding Macros to Your Setup," at the end of this chapter.)

ACTIVATE THE MACROS SPECIAL OPTION

The special option of AFC.MACROS allows you to activate or deactivate the macros capability in a setup. The MACROS special option can be turned on or off only through the Make Changes ... Special Options window.

In general, when a setup has the AFC.MACRO *character*, the MACROS *option* is on. The "S" and "T" setups are an exception — we ship these with the MACROS option off, so that new AFC users won't accidentally find themselves creating or retrieving macros.

The MACROS *option* does not appear if the overlay does not include an AFC.MACRO *character*.

Turning the MACROS option off does not delete any macros which are in the setup. The macros will still be there when you turn the option back on.

For this tutorial, follow the steps below to check or turn on the MACROS special option.

1. **Move the cursor to your setup.** For this tutorial, we recommend using the "S" or "T" setup for your input method, but you can use any setup that has the AFC.MACRO character in the overlay.
2. **Bring up the Choices window, and select MAKE CHANGES IN SETUP.** The Make Changes window appears.

- If the Make Changes window includes MACROS, then the option is already on. Press ESC and skip ahead to "Loading the Setup," below.
- If the Make Changes window does *not* include MACROS, then the option is off. Keep reading.

3. **To activate the MACROS option, select SPECIAL OPTIONS.**
4. **From the list of special options, select AFC.MACROS. (It will be near the end of the list.) Press RETURN for a description.**
5. **Press RETURN to change the setting. When ENTER NEW SETTING appears, press 1 RETURN to turn the option on. Press ESC to exit. Any changes you made will be saved on the disk.**

Now that the MACROS option is on, you are ready to load the setup and use macros.

Loading the Setup

1. **Load the setup. When the SETUP IN EFFECT window appears, put in the Sample Application Software disk and press RETURN.**
2. **From the Sample Application Software menu, select TEXT DEMO.**

The Text Demo program is a simple text-writing program. It has two modes: Simple Text, which merely displays what's typed on the keyboard, and Target Word, which allows you to practice writing a specific word (and ignores mistakes). You use CONTROL-S to switch between modes. For this tutorial, we'll stay in Simple Text mode, as if using a word processor.

3. **Press a few letters on the Apple keyboard or use your input device to select letters from your standard overlay. This demonstrates that this is a simple text-entry program.**

Retrieving Macros

When the MACROS option is on, the AFC Instant Message program is active: it is always ready to let you use any of the macros stored in that setup. To retrieve a macro while you are using an application program, you simply send the MACRO character, followed by the CODE NAME for the particular macro. For example, if the code name is XYZ for "I like alphabet soup,"

you would send: and this string would be sent to the computer:

MACRO XYZ

"I like alphabet soup."

To see how this works:

1. **Send the MACRO character** for your input method, or press '\ ' on the Apple keyboard. A tone will sound, indicating you have selected the MACRO character.

Reminder: With the AFC and in this manual, to *press a character* means to *send that character to the computer*. You may press the key on the Apple keyboard or use your AFC input method to press, send, or select that character. We use the term "press" to mean any of these.

2. **Now press the letter 'A'**. The string "Adaptive Firmware Card" will appear on the screen.

The CODE NAME for "Adaptive Firmware Card" was the letter A. The CODE NAME can be 1-15 characters long and can include numbers and punctuation, so the CODE NAME could have been "A1" or "AFC" or "99999" or whatever we wanted it to be.

3. To demonstrate that an AFC macro can store functions as well as text, **press ESC** to back up to the Sample Application Software Menu.

Let's imagine a situation where you start from this menu and have a particular task you will be doing frequently. Let's step through the task and write down each character you press.

The task is to select the Text Demo program, change it to Target Word mode, and enter the target word HOT SHOT.

- (1) To select the Text Demo program, press **2 RETURN**.
- (2) To change from Simple Text to Target Word mode, press **CONTROL-S**.
- (3) To enter the word HOT SHOT, press **HOT SHOT RETURN**.

The idea here is that you'll be setting up individual students to do this at different times during the day. Or maybe this example represents the type of process you use daily to set up your word processor.

4. Let's try using a macro which will do this task for you very quickly. If the Text Demo program is still on the screen, press **ESC** to return to the Sample Application Software menu.

Press the MACRO character, then the number 2.

The macro executes the same sequence you saw above: the Text Demo program is selected, it shifts to Target Word mode, and the target word appears on the screen for the student to copy. This happened because the macro stored under the CODE NAME '2' was the same sequence of keystrokes you used earlier:

2 RETURN (to bring up the Text Demo program)
CONTROL-S (to switch the program to Target Word mode)
HOT SHOT RETURN (to enter "hot shot" as the target word).

This is a very limited example of how you can use an AFC macro to quickly execute a series of commands. For example, you could use a similar set of commands to simplify the job of making your word processor print a document.

Using Message Rate to Slow Down Macro Retrieval

Some applications may not be able to handle a string of characters from a macro as fast as the AFC can send it. Furthermore, in some cases it is advantageous to slow down the execution of a macro to permit user interaction. (This will be described in Chapter 20, ADVANCED USE OF MACROS.) To meet these needs, the special option of MESSAGE RATE is available to let you control the rate at which the characters of a macro are retrieved.

To see how this works:

1. Use the Apple keyboard or your standard overlay to **send CONTROL-A 2**. (For help with CONTROL-A 2, see Chapter 4.)
2. Scroll through the special options window until the cursor is on **MESSAGE RATE**; **press RETURN**.
3. To slow down MESSAGE RATE on, **enter a lower setting, such as 5**. (29 = fastest rate, 1 = slowest.) **Press RETURN**.
4. To exit the special options window, **press ESC**.
5. If the Text Demo program is still on the screen, **press ESC** to return to the Sample Application Software menu.
6. **Press the MACRO character, then the number 2, as you did in the previous demo**. The macro will be retrieved, but it will be retrieved at a much slower rate.
7. If you prefer to have your macros retrieved at a faster rate, use CONTROL-A 2 to set the rate at a higher number. (The default setting is the fastest rate, 29.)

Creating Macros While Using an Application

When the MACROS option is active, the AFC Instant Message program is always ready not only to let you retrieve macros but to create new macros as well. It works as follows:

1. **Send the MACRO character, followed by a PERIOD.**

You will hear a tone, and the bottom of the screen will clear.

TO ADD NEW MACRO,

PLEASE ENTER CODE NAME:

2. To add a new macro, enter the **CODE NAME** you want the macro to have. This can be 1-15 characters long and can include letters, numbers, and punctuation.

TIPS REGARDING CODE NAMES

- (1) *Avoid CODE-NAME conflict.*

Conflicts occur when one CODE NAME is a subset of another CODE NAME. For example, A = Adaptive Firmware Card and AD = (your address) are in conflict. When you try to send MACRO AD, you won't be able to, because as soon as you send MACRO A, the AFC will retrieve "Adaptive Firmware Card" — you will, in effect, never be able to retrieve MACRO AD.

You can avoid CODE-NAME conflict if all the CODE NAMES in a setup are the same length or if all your CODE NAMES end in the same unusual character, such as a PERIOD. With the A and AD example, if AF = Adaptive Firmware Card and AD = (your address), or if A. = Adaptive Firmware Card and AD. = (your address), the codes do not conflict.

Using a PERIOD at the end of a CODE NAME is especially important in the S.ASCII setup — it contains macros which retrieve special characters for your communication device, such as OPEN APPLE, RESET, etc. The CODE NAMES we used all end in a period. To avoid conflict with these CODE NAMES, please use a PERIOD at the end of any macro CODE NAMES you add to the S.ASCII setup.

- (2) *Longer CODE NAMES take more time to send but may be easier to remember.*

For example, you could use AFC = Adaptive Firmware Card and ADD = (your address). These three-character CODE NAMES also keep things open for more codes beginning with the same two letters, such as

AFC = Adaptive Firmware Card	ADD = (your address)
AFD = afraid of<SPACE>	ADB = Apple desktop bus
AFT = afternoon	ADV = adventure

- (3) *The length of the CODE NAMES you use should be related to how many you are going to need.*

For example, single-character CODE NAMES allow you a maximum of 68 macros. Two-character CODE NAMES allow you a maximum of 900 macros.

- (4) *If you use an augmentative communication system which uses an encoding technique, you can design AFC CODE NAMES which parallel those used in your communication system.*

For example, the BlissApple program (by Vanderheiden and Kelso) uses digits to retrieve symbols, such as 123 = "mom." You can use the same codes as CODE NAMES with the AFC, that is, MACRO 123 = "mom."

Some portable devices use a system of level numbers plus location, such as "apple" stored in Level 5, location A. The AFC CODE NAME for "apple" could be 5A. Other portable devices use abbreviation/expansion, such as IMP = "This is important." The same codes can be used with AFC macros.

For this demo, enter a CODE NAME with the beginning letters of your first and last name, then press RETURN.

3. The screen changes to:

NOW TYPE MESSAGE:

For this macro, enter your full name, in upper and lower case as desired, then press RETURN.

4. To retrieve the new macro, **press MACRO then the two initials of your name.** Your full name should appear on the screen, just as you entered it.

If this is a "T" setup, the earlier macros had speech feedback, but the new macro did not. *When you create macros while using an application, they will not have speech feedback.* But if you save the new macros, you

can add speech to them later, using the Macro Manager program, described later in this chapter.

INCLUDING SPECIAL CHARACTERS

To insert a special character, such as ESC, RETURN, LEFT ARROW, etc. while you are creating a macro, press ESC when you are ready to insert the special character. For example, let's try creating a macro which is "Sincerely, <RETURN> <RETURN> <RETURN> <RETURN>".

1. To create a new message, **press MACRO then PERIOD.**
2. For the CODE NAME, **press the letter S.**
3. For the message, **enter** the word **Sincerely** then a **COMMA**. To enter RETURN: **press ESC.**

NOW TYPE MESSAGE:	ESC
Sincerely,	RET
	SPACE
	LEFT

A list of special characters will appear at the right side of the screen. This is essentially the same list of special characters available in the AFC Create Overlay programs, except that the names of the characters are somewhat abbreviated, and the last half of the list includes special macro commands which will be discussed in Chapter 20.

Use SPACEBAR or the ARROW keys to scroll through the list, or use the numbers 1-9 to employ the "ruler" function. Only four characters will appear at one time.

To insert one of these characters in your message, move the cursor to the name of the character and press RETURN. **For our example, move the cursor to RET (for RETURN, near the top of the list) and press RETURN.**

The character will be represented in the macro in a rather cryptic form (RETURN will show up as M), but this character will execute its proper function when you retrieve the macro while using your application program.

For our example, to enter three more RETURNS, press ESC and select RETURN three more times.

If you bring up the special-character list accidentally, you can press ESC to exit without selecting a character.

4. When the message is complete, **press RETURN**.
5. Make sure Text Demo Program is on the screen and you are in Simple Text Mode. To retrieve the macro, **press MACRO S**. "Sincerely," will appear on the screen, and the cursor will move down four lines, as if you had pressed RETURN four times.

Listing Macros While Using an Application

You may, while using a program, want to list the macros. For example, you might want to see if you've already used a certain letter or combination as a CODE NAME.

To list the macros in a setup while using an application program, press MACRO followed by a COMMA.

The bottom of the screen will begin listing your macros, four at a time. The list will include macros that were previously saved in this setup plus any new macros which you have created. The most recent additions will be shown first.

The beginning of the each line will give the CODE NAME, then the characters in the macro. **Press SPACEBAR to continue through this list OR press ESC at any time to return to the application program.**

Editing Macros

To edit a macro, press MACRO then PERIOD then the CODE NAME, just as if you were creating a new macro with that CODE NAME. The macro will appear at the bottom of the screen. Use RIGHT and LEFT ARROWS to move the cursor. New characters will be inserted at the cursor position. DELETE will delete the character to the left of the cursor. Press RETURN to keep the new macro.

Deleting Macros

To delete a macro, follow the procedure above to edit the macro (press MACRO then PERIOD then CODE NAME), then press CONTROL-X RETURN.

Saving Changes to Disk

When you create new macros, they are saved in the copy of the setup that is on your AFC and on the Quick-Start Menu. They are not automatically saved in the original setup that is on the Extended Menu.

If you want to save your changes on the Menu Disk, wait until you are ready to quit the application program, then press CONTROL-A 3. Put in your Menu Disk when prompted, and the new macros will be saved in the setup on the Extended Menu. *You probably do not want to do this in the setup we just used, but you will want to do it when you have added macros of value to you.*

"Allocated Memory Full"

If, while adding or editing macros, you encounter the message ALLOCATED MEMORY FULL, this means you have used up the memory set aside for instant messages in this setup, and your most recent addition or change cannot be saved.

To allocate more memory:

1. Use CONTROL-A 3 to save any recent changes in the setup.
2. Return to the Extended Menu, and use Make Changes ... Macros. From the Macro Manager Main Menu, select Change Memory Allocation. (A tutorial for using the Macro Manger begins on the next page. Information on Change Memory Allocation is included.)

USING THE MACRO MANAGER

The AFC Instant Message capability lets you create macros as you use an application program, as you did above. This is useful, because macros are often best created spur-of-the-moment, as you need them. There is, however, another way to create macros — the MACRO MANAGER. The Macro Manager program lets you create and edit macros for both text and mouse/joystick applications in a powerful, full-screen environment. It also lets you create and edit mouse/joystick tabs. You can list any of these on the full screen or send them to a printer. You can also use the Macro Manager program to add speech feedback to your macros or tabs and to adjust the amount of memory allocated for adding instant messages in your setup. (You will use mouse/joystick macros and tabs in Chapter 18.)

There are two ways of entering the Macro Manager program:

- If you are creating or editing the overlay, and you add the AFC.MACRO character, the option to WORK WITH MACROS will appear when you select Quit in the Create-Overlay program.
- If the MACROS special option is ON in a setup, you can enter the Macro Manager at any time by selecting the MAKE CHANGES ... MACRO window.

Procedures for using the Macro Manager program are described below.

Entering the Macro Manager from the Make Changes Window

1. Begin with the Extended Menu. **Move the cursor to your setup, and bring up the Choices window. For this tutorial, we recommend using your "S" or "T" setup.**
2. From the Choices window, select **MAKE CHANGES**, then select **MACROS**.

If the Make Changes window does not include MACROS, then either this overlay does not have the AFC.MACRO character or the MACROS special option has been turned off. (See "Adding Macros to Your Setup," at the end of this chapter.)

MACRO MANAGER: MAIN MENU

Please select:

- 1 - WORK WITH MACROS**
- 2 - WORK WITH MOUSE/JOYSTICK TABS
- 3 - CHANGE MEMORY ALLOCATION
- 4 - LIST CONTENTS
- 5 - INFORMATION
- 6 - TEST/SAVE/QUIT

Use arrows plus RETURN to select

3. The Macro Manager Main Menu will appear. It will always start with **WORK WITH MACROS**. If the overlay includes the **AFC.MOUSE/JOYSTICK** character, the menu will also include **WORK WITH MOUSE/JOYSTICK TABS**.

The **WORK WITH ...** choices will take you to programs for entering or editing macros or mouse/joystick tabs, respectively.

Creating Macros

You are now ready to begin creating macros or tabs. The basic steps are (don't do this yet):

- (1) **Enter CODE NAME for the macro or tab.**
- (2) **Enter what the computer will receive:** for example, enter the message for text macros, the sequence the mouse will perform for mouse macros, or the X & Y location for mouse tabs.
- (3) **Enter speech feedback user hears (if this setup has a talking overlay).**
- (4) **When you have programmed several macros or tabs, select TEST/SAVE/QUIT and SAVE your work to disk.**

To use this tutorial, select **WORK WITH MACROS**.

(1) ENTER NAME FOR MACRO:

Enter a code name from one to fifteen characters in length. You may use any letters, numbers, or punctuation. Press RETURN when done.

- or -

* Press <ESCAPE> for MAIN MENU

((ALLOCATED MEMORY USED: ##%))

4. The screen instructs you to ENTER NAME FOR MACRO. Enter a CODE NAME from one to fifteen characters in length. You can use any letters, numbers or punctuation.

Tips for CODE NAMES were discussed in "Creating Macros While Using an Application," earlier in this chapter.

Press RETURN when done.

(1) USER SENDS: <AFC.MACRO> + XXX

(2) ENTER MESSAGE COMPUTER RECEIVES:

Use these commands to edit your entry:

<ESCAPE> = special characters
<ARROWS> = move cursor
<DELETE> = erase one character
<CTRL-X> = erase entire entry
<RETURN> = done

5. The screen changes to show <AFC.MACRO> + the CODE NAME you indicated. Step (2) for macros is ENTER MESSAGE COMPUTER RECEIVES.

Enter the string of characters you want the computer to receive when this CODE NAME is given. When done, press RETURN. Special considerations are discussed below.

Note: The procedure for creating mouse/joystick tabs is very similar to the procedure for creating macros, but the text on the screen will be different. This step, for example, when creating tabs is "Give X & Y location for mouse."

UPPER- VERSUS LOWER-CASE

For text macros, if your application software accepts both upper-case and lower-case letters, **enter the message in the upper- or lower-case, as desired** (such as "yesterday"). When you later retrieve the macros, the message will be sent as you entered it, provided the AFC CAPS-LOCK function has not been toggled on. If you send the SHIFT character before sending the CODE NAME, the first letter of the macro will be capitalized ("Yesterday,"). If the AFC CAPS-LOCK function is on, the characters will be sent in all upper case ("YESTERDAY").

SPECIAL CHARACTERS

To place special characters, such as RETURN, LEFT ARROW, or OPEN-APPLE, in a macro, press ESC to bring up the special-character window. Move the cursor to the character you want to insert, then press RETURN. The name of the character you select (or an abbreviation) will be displayed in the MESSAGE line.

The first part of the special-character window is shown on the next page. Beyond AFC.MOUSE, there are also special characters available in this window that are not shown here. These extra characters are macro programming commands, which you should avoid at this time. They will be discussed in Chapter 20, ADVANCED USE OF MACROS.

**INSERT SPECIAL CHARACTER
(USE ARROWS + RETURN)**

<NONE>
<ESCAPE>
<RETURN>
<SPACE>
<LEFT ARROW>
<RIGHT ARROW>
<UP ARROW>
<DOWN ARROW>
- - - - -
<TAB>
<DELETE>
<CTRL-X>
<CTRL-Y>
<COMMAND/OPEN.APL>
<OPTION/SOLID.APL>
<CONTROL>
<CAPS-LOCK>
<SHIFT>
<NUM.KEYPAD>
<RESET>
<AFC.REPEAT>
<AFC.LEVEL>
<AFC.MACRO>
<AFC.MOUSE>
<AFC.NULL>

You can scroll through the special-character window in the usual way, or press numbers (1-9) to move to various points along the special-character ruler.

If a character is not in the special-character window, it is not really "special." To enter any character not in this window, simply press, send, or select that character in the usual way.

NOTE: SPACE, TAB, UP and DOWN ARROWS are not really special characters. They appear in the special-character window because many people expect them to be there. You can enter them in the macro through the special-character window OR in the usual way.

Most CONTROL- characters can be entered as-is by holding down the CONTROL key and pressing the associated character key (or sending these in sequence through your input method). The exceptions are CONTROL-X and CONTROL-Y, which are available through the special-character window.

To enter a numeric keypad character, first enter NUM.KEYPAD from the special-character window, then enter the character itself, such as 1, 2, =, -.

6. If the overlay in this setup includes speech feedback, the Macro Manager will take you to step (3): ENTER SPEECH FEEDBACK USER HEARS. If the overlay does not include speech feedback, skip to step 7, below.

(1) USER SENDS: <AFC.MACRO> + XXX

(2) COMPUTER RECEIVES:
Your macro is shown here.

(3) ENTER SPEECH FEEDBACK USER HEARS:
(same)

Use these commands to edit your entry:

<ARROWS> = move cursor
<DELETE> = erase one character
<CTRL-X> = erase entire entry
<RETURN> = done

If you want USER HEARS to be the same as what the computer receives, just press RETURN.

In the case of special characters, such as UP ARROW, "same" means no speech feedback.

If you want USER HEARS to be different from what the computer receives, just enter the speech you want the user to hear; press RETURN.

(1) USER SENDS: <AFC.MACRO> + XXX

(2) COMPUTER RECEIVES:
Your macro is shown here.

(3) USER HEARS:
The speech feedback is shown here.

=====
(Press <SPACE> to hear speech)

- 1 - PROCEED TO NEXT MACRO
- 2 - MODIFY 'COMPUTER RECEIVES'
- 3 - MODIFY 'USER HEARS'
- 4 - RETURN TO MAIN MENU

7. The screen changes.

- WITHOUT speech feedback, the screen shows 'User Sends' and 'Computer Receives' (for mouse tabs, 'Mouse Jumps to Location').

- WITH speech feedback, the screen also shows 'User Hears.' Your speech synthesizer will speak the entry for 'User Hears.'

Press SPACEBAR to hear the speech again.

Your choices at this point are on the bottom of the screen. If everything is as you want it, just **press RETURN to proceed.**

Changing or Deleting Entries

To modify or delete **COMPUTER RECEIVES** or **USER HEARS**, watch for **MODIFY 'COMPUTER RECEIVES'** and **MODIFY 'USER HEARS'** at the bottom of the screen. Move the cursor to your choice and press **RETURN**.

The screen will change to allow you to edit the existing entry.

To clear the whole entry, use CONTROL-X. To clear the entry from the cursor to the end, use CONTROL-Y.

To modify the entry, use **ARROWS** to move the cursor, then insert the new text.

To delete characters, move the cursor to the right of the character, then press **DELETE**.

When done editing an entry, press RETURN.

Saving Your Work

You *must* save your work before turning off the computer, or it will all be lost. It is also a good idea to save your work fairly often (such as every 10 minutes), even if you are not ready to quit. To save the macros or tabs you are working on:

1. **Get the Macro Manager Main Menu on the screen.** (Select **RETURN TO MAIN MENU** from the bottom of the screen or press **ESC** when the screen says "Enter name for")
2. **From the Main Menu, select TEST/SAVE/QUIT.**

- 1 - TEST IT!
- 2 - CONTINUE EDITING/CREATING
- 3 - SAVE TO DISK
- 4 - QUIT

3. You will see a screen with Test/Continue/Save/Quit choices. **To save your work, select SAVE TO DISK.**

You will see **SAVING SETUP** while the revised setup is being saved on the Menu Disk. You will be returned to the page of choices.

TEST IT!

To check your work as you go along, you can select **TEST IT!** from the **TEST/SAVE/QUIT** choices, described above.

+ + + + + + + + + + + + + + + + +
 +
 + + + + + + + + + + + + + + + + +

When you select TEST IT!, a Test Run page appears. You must have an AFC and an input device to use the Test Run page. Use your input method to send the macros or tabs. Text will appear in the window. Mouse commands will be represented by text only, since the Test Run program is not a mouse-based application.

To exit the Test Run page, press ESC.

QUITTING

When done with your work, select **QUIT** from the **TEST/SAVE/QUIT** choices. If you have made changes since the last save, you will be asked if you want to save or throw out the changes.

After quitting, the Macro Manager will return you to the Extended Menu.

Listing Macros or Tabs

The Macro Manager provides a way you can list the contents of macros and/or tabs on the screen or to a printer. To list the contents, you can:

- select **LIST CONTENTS** from the Macro Manager Main Menu, or
- select **GET MORE INFORMATION ... MACROS** from the Extended Menu

Either way takes you to **LISTING OF CONTENTS**.

If this setup has more than one type of macros or has tabs, you will be asked which type you want to list: **MACROS**, **MOUSE/JOYSTICK TABS**, or **ALL OF THE ABOVE**.

Then you will be asked to choose **DISPLAY ON SCREEN** or **SEND TO PRINTER**.

A listing will appear, arranged by type of macro (if you selected "all of the above") and by numeric-alphabetical order of the **CODE NAME**. The list will show the **CODE NAME** in the left column and the contents of the macro or tab in the right column. If speech feedback is part of this setup, the **SPEECH** will also be listed for each macro/tab.

Changing Memory Allocation

When the **AFC.MACRO** character is included in or added to an overlay, a recommended minimum amount of memory (500 characters) is automatically set aside in the setup to allow you to add macros or

mouse/joystick tabs with the Instant Message program. You can, however, change this memory allocation to suit your application.

The "S" and "T" setups are shipped with an allocation of 100 characters for instant messages.

To change the memory allocation for Instant Message creation of macros or mouse/joystick tabs, select **CHANGE MEMORY ALLOCATION** from the Macro Manager Main Menu.

ALLOCATE MEMORY FOR INSTANT MESSAGES:

| | | |
|----------|------|---|
| TOTAL: | 1032 | Use up & down arrows to set aside more or less memory for macros which you will create as instant messages: |
| MACROS: | 500 | Minimum 40
Maximum 3564 |
| OVERLAY: | 532 | Recommended 500 |

Use UP & DOWN ARROWS, press RETURN

The screen will change to display the amount of memory taken up by this setup. This includes the memory required by this particular overlay plus the amount reserved for Instant Message creation of macros or tabs.

Use the **UP and DOWN ARROWS** to set aside more or less memory for macros and/or tabs.

The maximum total memory for any setup is 4000 characters.

Note: The memory required by the overlay is not adjustable through this program: the only way to adjust the memory used by the overlay is to delete or add to the characters or speech feedback in the overlay itself.

LEAVING THE MACRO MANAGER: "QUICK-START MENU FULL"

If your setup is on the Quick-Start Menu, and you use the Macro Manager program to allocate more memory for instant messages, there's some chance your setup could become so large that it won't fit on the Quick-Start Menu along with the other setups that are there now.

When you save the revised, larger setup from the Macro Manager program, it will save. But when you select Quit, and you return to the Extended Menu, you could get the error message QUICK-START MENU FULL.

If this happens, you'll need to do some rearranging of the Quick-Start Menu:

1. Use CONTROL-R to move the changed setup off the Quick-Start Menu.
2. Go to Other Options at the end of the Extended Menu, and select Clear Quick-Start Menu.
3. Now you can experiment with moving other setups off the Quick-Start Menu, if you want to put the changed setup back in the fixed Quick-Start Menu.

Comparing the Macro Manager and Instant Message Programs

The Macro Manager program is a full-screen program with considerable power and flexibility. It provides many features the Instant Message program cannot. The Instant Message program is more limited, because it shares the computer with your application program. It has the advantage, however, of letting you create new macros and tabs while using your application program.

The differences between the two programs are summarized in Figure 17-1.

Figure 17-1. Differences between the Macro Manager and Instant Message Programs.

| MACRO MANAGER PROGRAM | INSTANT MESSAGE PROGRAM |
|--|--|
| To enter the Macro Manager, select MAKE CHANGES ... MACROS from the Extended Menu. | The Instant Message program is active whenever a setup is active and the MACROS special option is on. |
| You create macros or tabs in the setup, then later load the setup and try them out with the application program. | You create macros or tabs while using the application program. |
| You can create macros which include special characters , such as RETURN, ESC, OPEN-APPLE, etc. | You can create macros which include special characters, but the abbreviations are shorter and the representations more cryptic. |
| If this setup has a talking overlay, you can separately enter or change the SPEECH FEEDBACK for a macro or tab. | Speech feedback is not added to new macros or tabs which you create. You can save the new messages, however, with CONTROL-A 3, and add speech later through the Macro Manager program. |
| You can get a full-page listing of macros and tabs, on the screen or sent to a printer. The listing will include speech feedback. | You can get a listing of <i>macros only</i> on the bottom four lines of the screen while you are using the application program. |
| You can change the memory allocation for instant messages in this setup. | Not available through the Instant Message program. |

ADDING MACROS TO YOUR SETUP

To add macros to your setup and save them on the Menu Disk, three basic steps are involved.

1. Use the Vital Statistics window to make sure "macros capability" is YES.
2. Use the Macro Manager or Instant Message program to create or edit macros.
3. Save the changes on the Menu Disk.

Each of these steps is explained below.

1. **Use the Vital Statistics window to make sure "macros capability" is YES.**

Bring up the Choices window for your setup, select Get More Information, then select Vital Statistics.

If the Vital Statistics window shows "macros capability" is YES, go ahead to create or edit macros (step 2, below).

If "macros capability" is OFF, the overlay includes the AFC.MACRO character, but the special option of AFC.MACROS has been turned off. Use the Make Changes ... Special Options window to turn AFC.MACROS on. Then you can proceed to create or edit macros (step 2, below).

If the "macros capability" is NO, the AFC.MACRO character is not in the overlay: you can use the Make Changes ... Overlay window to edit the overlay and add the character. For help editing your overlay, see Chapter 7. (For scanning, see the chapter titled SCANNING.) To insert the AFC.MACRO character:

- (a) Indicate item user will select.
- (b) For COMPUTER RECEIVES, press ESC and select AFC.MACRO from the special-character window.
- (c) Return to the Create Overlay Main Menu, select Test/Save/Quit, then select SAVE TO DISK.

2. Use the **Macro Manager** or **Instant Message** program to create or edit macros.

- There are two ways to enter the **Macro Manager** program:

If you are creating or editing the overlay, and you add the AFC.MACRO character, an option to work with macros will appear when you select the Quit option in the Create-Overlay program. Selecting this option will take you to the Macro Manager.

OR

From the Choices window for your setup, select Make Changes ... Macros. This takes you directly to the Macro Manager, where you can create new macros, edit or delete macros, get a printed listing, etc., in a full-screen environment. (See "Using the Macro Manager," this chapter.)

If MACROS does not appear in the Make Changes window, either the overlay does not include the AFC.MACRO character or the AFC.MACROS special option has been turned off. Check the Vital Statistics window (step 1 on the preceding page).

- To enter the **Instant Message** program, load your setup and use it with an application program. The Instant Message program is available in the background when you use your setup with an application program. This will let you create, edit, and delete macros as you use them. (See "Using Text Macros with an Application," this chapter.)

3. Save the changes on the Menu Disk.

If you add or edit macros with the **Macro Manager**, be sure to select Test/Save/Quit, then save your work to disk.

If you add or edit macros with the **Instant Message** program, the changes are automatically saved in the copy of the setup that is on the AFC. *To save these changes on the Menu Disk, use CONTROL-A 3.* Do this when you are done with your application but before you turn off the computer. For help using CONTROL-A 3, see Chapter 4.

SUMMARY OF USING TEXT MACROS

If the AFC.MACRO *character* is in an overlay, the setup has the *capability* for macros. If the AFC.MACROS *special option* is on, the capability is active.

To determine capability

If Get More Information ... Vital Statistics window shows "macros capability" = YES, then MACRO character is in overlay and the option is on.

If "macros capability" = OFF, then MACRO character is in overlay but the option is off. Use Make Changes ... Special Options to turn option on.

If "macros capability" = NO, then MACRO character is not in overlay. Use Make Changes ... Overlay and add the AFC.MACRO character. This will change "macro capability" to YES.

To activate or deactivate the capability

Use Make Changes ... Special Options to turn AFC.MACROS option on (active) or off (inactive). Turning it off does not delete macros.

List complete contents of macros

Get More Information ... Macros window or
List Contents in Macro Manager program

While using an application

| | |
|----------------------|--|
| Retrieve macros | MACRO character + CODE NAME |
| List macros | MACRO character + COMMA |
| Add or edit macros | MACRO character + PERIOD
ESC to insert special character
ARROWS to move cursor and edit text
DELETE to delete character to left of cursor
CONTROL-X to delete entire message |
| Save changes to disk | CONTROL-A 3 |

To slow down or speed up macro retrieval

Adjust MESSAGE RATE
(1 = slowest; 29 = fastest)

CONTROL-A 2 or
Make Changes ... Special Options

Macro Manager Program

Create or edit macros in a full-screen environment

Add speech feedback to macros, provided setup has a talking overlay

List complete contents of macros, on screen or to printer

Change memory allocation for adding instant messages

To enter

select Work with Macros when you exit the Create-Overlay program
or

use Make Changes ... Macros window.

CHAPTER 18

EMULATING THE MOUSE

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CHAPTER 18

EMULATING THE MOUSE

This chapter will provide detailed information on AFC mouse emulation, to be used with any AFC input method. We assume you are already familiar with your particular input method.

The basic function of the Adaptive Firmware Card is to provide an alternative to using the standard Apple keyboard. In this sense, the AFC is a *keyboard emulator*: whenever an application program calls for typing on the keyboard, you can use your AFC input method instead.

Many programs for the Apple IIGS, however, look for *mouse input* instead of, or in addition to, keyboard input. In order to provide access to such programs, the AFC may act as a *mouse emulator* as well.

In addition, the AFC may emulate a joystick, game paddles, and some drawing tablets. For the most part, *joystick emulation* is very similar to mouse emulation, so much of this chapter applies to both. See Chapter 19, EMULATING THE PADDLES OR JOYSTICK, for specifics.

PREVIEW

As a preview to mouse emulation, let's look at what mouse application software generally asks you, the user, to do with a mouse. At first glance, it's fairly simple: you move the mouse to move the pointer around on the screen, and you hold, click, or double-click the mouse button.

On second glance, you'll find that a mouse-emulation device must be capable of some very complex maneuvering. To use mouse software without a mouse, you must be able to:

1. move the pointer to very precise locations anywhere on the screen (such as to a certain place on the menu bar or between two characters in a word processing or spreadsheet document)

2. click or double-click the button on a specific location (such as a command box)
3. move the pointer while holding down the button (such as in using pull-down menus or in drawing with a graphics program) then release the button
4. accomplish all of the above by means of *your special-input method* (such as scanning, Morse code, or an expanded keyboard).

OVERVIEW

The Adaptive Firmware Card accomplishes mouse emulation by means of a special operating mode, called MOUSE/JOYSTICK EMULATION MODE, which we'll call *mouse mode* for short. Once you enter mouse mode, ordinary letters, such as U, D, L, R, C, become *mouse commands*, which make the mouse pointer move in different directions, or which click and release the mouse button. After you exit mouse mode, they become ordinary letters again.

To enter mouse mode using an AFC input method, simply send the AFC.MOUSE/JOYSTICK character — this character must be included in the overlay for a setup to be able to do mouse emulation. (Or from the Apple keyboard, press '\ ' followed by '='.) To exit mouse mode, press Q.

While in mouse mode, you may move the mouse pointer by using the ARROW keys (for smooth movement) or by using certain letter keys to move the mouse pointer by small, medium, or large steps. Other letters will let you click, double-click, hold down, and release the mouse button. In addition, a ROTATING ARROW MODE is available, which provides an efficient means of moving the mouse by means of a single switch.

MOUSE TABS are available for quick positioning of the pointer to predetermined locations. You can both set and use mouse tabs while using the application program. *TEMPORARY TABS* can also mark your current pointer position for a quick return after you use the pointer elsewhere.

MOUSE MACROS can be used to execute complex mouse procedures with just two characters. You use the Instant Message feature of the AFC to create macros which consist of a string of mouse commands, such as: marking a temporary tab location, using another tab to move to a title on the menu bar,

pressing down the button, dragging the pointer down so many pointer steps to a particular command on the menu, releasing the button to select that command, then returning the pointer to the previously marked temporary tab location. Once you create this long message, you can use it at any time from any pointer location by sending as few as two characters: the MACRO CHARACTER and the CODE NAME (1-15 characters) for that macro.

All of these features will be described in detail in the following section, "Using Mouse Emulation."

Tips and Cautions

Mouse-based programs are a mixed blessing: they can be very user-friendly for a person who uses a mouse, but they can be very difficult to run through basic mouse-emulation techniques. If you are a beginning AFC user, we suggest:

1. **Avoid mouse emulation at first.** *Basic mouse emulation is inherently inefficient.* If you have a choice between two application programs, one which requires the mouse and the other which lets you do everything through the keyboard, the keyboard-based program will probably be easier to use as a beginning AFC user.
2. **Look for keyboard equivalents.** Many mouse-based programs give you two ways of doing the same things — one way using the mouse, the other way using the keyboard. Many pull-down-menu functions have keyboard equivalents listed in the user's manual. As described above, you can use AFC mouse macros to execute any command with as few as two characters, but this requires planning and creating the macros. *If the program offers a way to execute the same commands without the mouse, you can save considerable planning-and-creating time by using the keyboard equivalents, rather than the mouse.*

On the other side of the mixed blessing, the AFC's MOUSE MACRO capability makes it possible to create a setup for a mouse-based program that makes very efficient use of your alternate input method. A well planned setup can, in fact, make a mouse-based program *very* user-friendly to an alternate-input user! However, creating this type of setup calls for advanced use of AFC macros (Chapter 20) and takes intermediate to advanced experience with the AFC.

USING MOUSE EMULATION

In this section, you will use a special MOUSE DEMO setup for your AFC input method and a demonstration mouse-based program by Apple. Step-by-step instructions are given.

Getting Started

To use this section as a hands-on tutorial, you will need:

- An Adaptive Firmware Card, already installed
- Your copy of the AFC Menu Disk
- The disk titled *Your Apple Tour of the Apple IIGS* — this came with your Apple IIGS computer.
- Your input device (such as switches or an expanded/miniature keyboard). You may use the OPEN-APPLE and OPTION/SOLID-APPLE keys as switches, if you prefer.
- Experience with the standard overlay for your input method. If you are not familiar with the standard overlay, see the "Using ..." section in the chapter for your input method.

***** CAUTION:** *Make sure the computer is OFF when connecting or disconnecting switches or cables. ****

Loading the Setup

1. Boot the AFC Menu Disk.
2. Move the cursor to the setup which has the title **MOUSE DEMO** and which lists your input method in the **INPUT** column. Press RETURN for the Description window.

Each mouse demo setup contains the standard overlay for that method.

3. From the Description window, **press RETURN**.
4. From the Choices window, **select MAKE CHANGES IN SETUP**.
5. From the Make Changes window, **select METHOD/RATE**. Move through the windows to **set the method and/or rate** to what you are most comfortable using.
6. After setting the method and rate, you will be returned to the Choices window. **Select LOAD THIS SETUP**.
7. If your AFC is turned off, you will be prompted to turn it on.
8. When the SETUP IN EFFECT window appears, take out the Menu Disk and **put in the application disk, *Your Apple Tour of the Apple IIGS***. **Press RETURN** to boot the new disk.
9. The program will take some time to load. A window-shade title page will roll down, then back up. After the shades rolls back up, an instruction window will appear. **Ignore the instructions — press, send, or select ESC** to proceed directly to the main menu of this program.

Reminder: With the AFC and in this manual, to *press a key* means to *send that character to the computer*. You may press the key on the Apple keyboard or use your AFC input method to press, send, or select that character. We will use the term "press" to mean any of these.

10. The screen changes to show a menu bar across the top.

Some programs give you a choice between using the mouse or the keyboard. This program does not. **Try using the Apple keyboard or your AFC input method**. The program will put up an instruction window, telling you to use the mouse.

Using the Mouse

ENTERING MOUSE MODE

1. To enter AFC mouse emulation mode, use the **AFC.MOUSE/JOYSTICK** character in your overlay. The MOUSE/JOYSTICK character for each standard overlay is listed below. If you are using the Apple keyboard, use the '\ ' key, followed by the '=' key.

| <u>Standard Overlay</u> | <u>AFC.MOUSE/JOYSTICK character</u> |
|-----------------------------|---|
| Assisted kbd | '\ ' + '=' |
| Expanded kbd: Unicorn | row 1, above the MESSAGE square (3 squares)
(MOUSE is not marked — see Figure 10-1)
TASH4th square in top row |
| Morse code | -- • --- (MJ) |
| Scanning | '=' in the alphabet array |
| ASCII input..... | ESC + '=' |

2. The bottom of the screen will indicate you are entering mouse mode.

ENTERING MOUSE/JOYSTICK MODE

(PRESS ANY KEY)

3. To continue, press any key. The prompt will disappear.

If you ever enter mouse mode by accident, you can press Q to quit.

In order to practice moving the mouse pointer, ignore the program instruction screen for now.

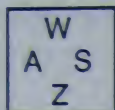
MOVING THE MOUSE POINTER

With the AFC, you can use certain letter characters to move the mouse pointer in small, medium, or large steps, or you can move the pointer smoothly and continuously by using the ARROW characters or a ROTATING ARROW MODE . Try each approach, described below, to see which you prefer.

Small, Medium, Large Steps

Different groups of letters move the cursor up, down, right, and left in different step sizes. Try these out and notice how the mouse pointer moves on the screen:

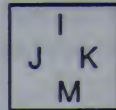
large steps



medium steps



small steps



To repeat one movement several times, you can press the letter to move one step, then use the AFC REPEAT function for your method.

(For help with the repeat function, see "REPEAT" in the "Using ..." section of the chapter for your input method. With Mouse Demo scanning, the special option of REPEAT METHOD is set = 0, but you can change it = 1, if you prefer — see the SCANNING chapter.)

Smooth Movement: Arrow Keys

The AFC provides two ways you can move the pointer smoothly, rather than in steps. In general, the smooth-movement approach is more efficient than movement by steps. The first approach is to use the four ARROW keys. The idea is if you hold down an ARROW key on the Apple keyboard, the mouse pointer will begin moving slowly in that direction and will accelerate as you continue to hold down the key. If you release the key, then re-press it, the pointer will stop, then start moving again at the slower rate. If you are familiar with the Macintosh® computer, you may recognize this as being similar to the "mouse keys" function of the Easy Access feature, available in Apple Macintosh System Software Version 5.0

Use the instructions below to try using ARROWS to move the cursor.

For the **Apple keyboard**, **assisted keyboard**, or **expanded keyboard**, press the key or square for the ARROW you want. The pointer will begin moving slowly in the direction of the arrow. It will continue moving, at a gradually faster rate, for as long as you hold down your key. If the pointer begins moving too quickly, release your key, then press the ARROW character again.

For **Morse code**, send the code for the ARROW you want, then quickly press your switch and hold it closed. The pointer will begin moving (in the direction you selected) and will continue moving, accelerating gradually, as long as you hold the switch closed. If the pointer begins moving too quickly, release your switch, then quickly press it again to resume movement at the slower speed. To exit movement mode, release your switch, then wait until you hear a tone — this indicates you have left smooth-movement mode. When you next press the switch, you will hear the usual *dit-dah* tones.

For **scanning**, select the ARROW character you want from the scanning array. The pointer will begin moving (in the direction you selected) and will continue moving, accelerating gradually. If the pointer begins moving too quickly, press your switch to stop it, then quickly press it again to resume movement at the slower speed. To exit movement mode, press your switch to stop the pointer, then wait until you hear a tone — this indicates you have left smooth-movement mode. When you next press the switch, the scanning array will reappear.

For **ASCII**, send the ARROW character you want from your communication device. The pointer will begin moving (in the direction you selected) and will continue moving, accelerating gradually. If the pointer begins moving too quickly, send any item from your input device to stop it, then quickly send the ARROW again to resume movement at the slower speed. To exit movement mode, send any item to stop the pointer, then wait until you hear a tone — this indicates you have left smooth-movement mode.

The smooth-movement ARROW-key function you have just tried can be adjusted in several ways, including the rate at which the pointer moves and the method for controlling the movement. For Morse code, scanning, and ASCII, the pause required to end movement mode is related to the special option called ROTATION RATE. These adjustments are discussed under "Options for Smooth Movement: Arrow Keys," near the end of this chapter.

Smooth Movement: Rotating Arrow

The second smooth-movement approach lets you move the mouse pointer smoothly in response to a rotating arrow. This was designed primarily for switch users. A person using the Apple keyboard, assisted keyboard, or expanded keyboard would most likely de-activate this function, but we have

left it active in the Mouse Demo setups, so you can see what the rotating arrow is like.

1. **Use your input method to select SPACE.** This will bring up the rotating arrow.

As the arrow rotates, it will indicate a choice of directions (up, right, down, left); mouse commands (C for click, B for button down); and the rotating arrow mode exit command (X).

2. **Use the instructions below to respond to the arrow.**

For the **Apple keyboard, assisted keyboard, or expanded keyboard**, when the arrow is pointing in the direction you want, press and hold any key or square. The pointer will begin moving slowly in the direction of the arrow. It will continue moving, at a gradually faster rate, for as long as you hold down your key. If the pointer begins moving too quickly, release your key, then quickly press it again — the pointer will resume moving, at the slower rate. To exit the rotating arrow, release your key to stop the pointer, then press any key when the "X" appears in the rotation.

For **Morse code**, when the arrow is pointing in the direction you want, press your switch and hold it closed. The pointer will begin moving (in the direction you selected) and will continue moving, accelerating gradually, as long as you hold the switch closed. If the pointer begins moving too quickly, release your switch, then quickly press it again to resume movement at the slower speed. To exit the rotating arrow, release your switch to stop the pointer, then press your switch when the "X" appears in the rotation.

For **scanning**, when the arrow is pointing in the direction you want, press and release your switch. The pointer will begin moving and will continue moving, accelerating gradually. If the pointer begins moving too quickly, press your switch to stop it, then quickly press it again to resume movement at the slower speed. To exit the rotating arrow, press and release your switch to stop the pointer, then press and release your switch when the "X" appears in the rotation.

For **ASCII**, when the arrow is pointing in the direction you want, send any item from your communication device. The pointer will begin

moving and will continue moving, accelerating gradually. If the pointer begins moving too quickly, send any item from your input device to stop it, then quickly send any item to resume movement at the slower speed. To exit the rotating arrow, send any item to stop the pointer, then, send any item when the "X" appears in the rotation.

3. The C and B in the rotating arrow are mouse commands— don't use these yet. **Select X to exit the rotating arrow mode.**

The rotating arrow in a setup can be tailored to the application program and to the user. You can change your method of controlling the pointer, the rate of rotation and speed of pointer movement, the size and location of the rotating arrow, the number of directions shown, and the number of mouse commands included in the rotating arrow mode. We'll discuss the AFC special options which govern these under "Options for Smooth Movement: Rotating Arrow," near the end of this chapter.

Summary: Moving the Mouse Pointer

Letter keys: small, medium, and large steps
Arrow keys: smooth, continuous movement
Spacebar: brings up rotating arrow

Now that you have a feel for moving the pointer, we'll get back to the application program. In a mouse-based program, you not only need to move the pointer but to manipulate the mouse button as well.

HOLDING AND RELEASING THE MOUSE BUTTON

The top of your screen shows a menu bar. Each title on the menu bar represents a separate pull-down menu. To "pull down" a menu, you point to the title and hold down the mouse button.

1. **Move the pointer to the title "What the IIGS Can Do."** The pointer can be touching any part of the title.
2. **To hold down the mouse button, press B** (for Button down).

Hint: If you're using the rotating arrow, you can select letters from the arrow or from your overlay.

3. The pull-down menu for "What the IIGS Can Do" will appear.

To release the mouse button, press X.

The pull-down menu disappears. Holding the button down (B) pulls down the menu. Releasing the button (X) causes it to disappear.

4. To choose a command from a pull-down menu, you hold the button down, move the pointer to the command you want, then release the button. For this demo, we want to choose the "Graphics" command on the "What the IIGS Can Do" menu:

(1) Move the pointer to "What the IIGS Can Do."

(2) Press B (to hold the button down)

(3) Move the pointer down the menu to the word "Graphics."

Hint: you can use a smooth-movement approach (DOWN ARROW or rotating arrow), or medium steps will do this nicely (use D). The commands in the window will be highlighted as the pointer touches each.

Moving the pointer while the mouse button is down is called *dragging*.

(4) Press X to release the mouse button, thereby selecting the command "Graphics."

The screen will change to a drawing of an Apple II Graphics disk. A FORWARD ARROW at the bottom of the screen will also begin flashing.

CLICKING

Pressing and releasing the mouse button is called *clicking*. With the AFC, you can click by pressing C.

1. To proceed in the Apple program, you must *click* on the FORWARD ARROW to go forward, on the BACK ARROW to go back, or on Main Menu to return to the main menu.

Move the mouse pointer to the FORWARD ARROW.

When the pointer is on the FORWARD ARROW, **press C to click the mouse button.** This presses and releases the mouse button quickly.

2. The screen changes to a sample graphics program. Read the instruction window.

The FORWARD ARROW will be flashing again. This is your hint to click on the FORWARD ARROW to go on. Your mouse should still be on the FORWARD ARROW; **click (press C) to go on.**

3. More instructions appear. The tools for drawing lines and shapes are on the left side of the screen. **Click (press C) to go on.**

In some programs (not this one), *double-clicking* is useful. In AFC mouse mode, **to double-click, press COLON or SEMI-COLON.** We will not be double-clicking in this demo. Other combination commands, such as SHIFT-CLICK, are listed in Figure 18-1, later in this chapter.

4. The tool for drawing lines is in the first column, the fifth box down. **Click (press C) to go on.** The instructions should now say "Click on the line tool." Read below for a way to do this quickly.

USING TABS

MOUSE TABS are a convenient way to move quickly to frequently needed points on the screen. We have included several tabs in the Mouse Demo setup to help you get the feel of how useful mouse tabs can be. These tabs have been set for this particular demo graphics program.

1. The instructions will say, "Click on the line tool." You could use the rotating arrow, ARROWS, or letters to move the cursor to the line tool. To get there more quickly, however, **press TAB, then press L.**

Notice that the pointer jumps immediately to the line tool. That is because we previously set a mouse tab at that location and gave it the name 'L' (for line tool).

2. When the pointer is on the line tool, **click (press C) to select the tool.**

3. The instructions will change. Try drawing a line:
 - (1) **Move the pointer within the drawing area.**
 - (2) **Press B for Button down.**
 - (3) **Move the pointer around on the screen.** A line will be drawn from the button-down position to the current pointer position.
 - (4) When you have a line you like, **press X to release the button.**
4. The program instructs you to draw a few more lines. Go ahead, using the four steps above. (You don't need to click on the line tool again — it is still highlighted — but you can use TAB L to see that TAB L works from anywhere on the screen.)
5. **When ready to go on, use TAB F to move the pointer to the FORWARD ARROW. Click on the ARROW.**
6. Try backing up a page: **use TAB B (for BACK ARROW), then click.** This will move you back to the previous page.
7. To move forward again, **use TAB F, then click.** You should wind up on the page that says "Click the rectangle tool."
8. We have not preset a tab for the rectangle tool, but you do have a fairly quick way to get there:
 - (1) **Use TAB L to jump to the line tool.**
 - (2) **Move the pointer down one medium step.**

This demonstrates that you don't have to have a tab for every location on the screen. Let's set a tab at the rectangle tool, however, so you can see how easily it's done.

SETTING TABS

1. To set a tab:
 - (1) **Move the pointer to the desired location** (such as the rectangle tool).

- (3) The bottom of the screen will show:

TO SET TAB,

PLEASE ENTER CODE NAME:

- (4) **Enter the the tab CODE NAME** (such as R for rectangle tool), then press **RETURN**.

A tab CODE NAME can be 1-15 characters long and can include numbers and punctuation. The same rules apply as for a macro CODE NAME. (See Chapter 17.)

Please don't use a number as a tab name in this demo — we've preset some tabs with numbers which you will use later.

- (5) The prompt disappears. The tab has been set.
- (6) To check your work, move the pointer away from the tab location, then use **TAB** plus the new tab name. The pointer should jump to the correct tab location.

To delete a tab (don't do this now), press **TAB**, then press **CONTROL-X**. A prompt will appear, asking you to enter the CODE NAME. Enter the CODE NAME for the tab you want to delete, then press **RETURN**. This will delete that tab.

2. **Click (press C) on the rectangle tool.**

3. To draw a rectangle, per the instructions on the screen:

- (1) **Move the pointer to somewhere in the upper left corner of the drawing area.**
- (2) **Press B** to hold the mouse button down.
- (3) **Move the pointer down and to the right.** A rectangle will form as you move the pointer.

- (4) When the rectangle is the size and shape you want, **press X** to release the mouse button.
4. You can now make more rectangles. **When done, use TAB F, then click (press C) to go on.**

The screen says you can click on the FORWARD ARROW or press RETURN to go on. Pressing RETURN will work, even though you are in mouse mode. This is because a few characters retain their meaning even when you are in mouse mode: RETURN, DELETE, and COMMAND/OPEN-APPLE and OPTION/SOLID-APPLE combined with another character.

5. The screen will next tell you to select the filled rectangle tool. (This is to the right of the rectangle tool.) **Use TAB R to move to the rectangle tool, then take a medium step to the right. Click (press C) on the filled rectangle tool.**
6. Next you need to move the pointer to any of the patterns at the bottom of the screen. **Suggestion: use TAB B or F to get to one of the bottom ARROWS, then move the pointer from there to the pattern you want. Hint: if you're using letters to move in steps, medium steps work nicely within the pattern bar.**

Click on the desired pattern.

7. To draw a filled rectangle, per the instructions on the screen:
- (1) **Move the pointer into the drawing area — to a starting location for the new rectangle.**
 - (2) **Press B.**
 - (3) **Move the pointer in two directions to draw the rectangle.**
 - (4) **When the rectangle is the desired shape, press X to release the mouse button.**
8. The shading will appear in the rectangle.

Let's say you would like to experiment with various patterns. You'd like a way to mark where you are in the drawing area, move down to select a new pattern, then quickly return to the same spot in the drawing area. You can do this by means of TEMPORARY TABS.

SETTING AND USING TEMPORARY TABS

1. **To mark the present position of the pointer, press F (for Fix this location).** This sets TEMPORARY TAB location #1. (You did not need to press TAB, just F; TAB F is completely different — it would take you to the FORWARD ARROW.)
2. **Move the pointer anywhere to do anything you want.** In this demo, try TAB B or TAB F, then move into the patterns and click on a new pattern.
3. **To return to temporary tab location #1, press G (for Go).** You can now resume work in the previously fixed location. (Press B and try drawing another shaded rectangle.)

You may continue to practice setting and using temporary tabs.

Note: A second pair of temporary tabs is available: use N to *set* temporary tab #2 and O to *go* to temporary tab location #2.

CHANGING THE STEP SIZE

When you are moving the pointer by letters, you are using small, medium, or large steps. In the Mouse Demo setup, the medium-size steps were tailored to the pull-down menus at the beginning of the program and to the tool bar and pattern bar in the graphics program. Another program may space its menu items differently.

You can modify the step sizes to best fit your application program.

1. **To look at or modify the step sizes, press P (for Pointer step size).**
2. The bottom of the screen will display a window with the current step sizes for this setup:

| | |
|--------------------------|------------|
| MOUSE/JOYSTICK STEPS: | Use arrows |
| SMALL UP/DOWN = 2 | + Return |
| SMALL LEFT/RT = 2 | to select |
| MED. UP/DOWN = 12 | ESC = done |
| (scroll to other steps) | |

3. To change a step size:

- (1) **Move the cursor to the pointer step you want to change (such as large up/down) then press RETURN.**
 - (2) **Enter the new setting (such as 75), then press RETURN.**
 - (3) Repeat this for any other steps you want to change (such as large left/right).
 - (4) **When the settings are listed as you want them, press ESC.**
4. **Try the step sizes for the steps you changed (such as large steps up/down and left/right).**

To make further modifications in the step sizes, press P at any time.

For this demo, you might try adjusting the size of the medium left/right steps, then try using the new medium steps with the pattern bar. This will help you see why a medium left/right size of 11 was chosen. Be sure to set the step size back to 11 when done.

5. **When done, press RETURN (or use TAB F, then click) to move on.**

Note: "Smooth" pointer movement (available by using ARROW keys or rotating arrow mode) is actually movement by small steps. If you change the small step size, you will notice a corresponding change in the rate of smooth pointer movement.

Since this is a Mouse Demo setup for a demonstration graphics program, we are not concerned about saving any additions or changes made with tabs or step size. But saving such changes may be important in your later use of mouse emulation. Information is included in "Adding Mouse Emulation to Your Setup," later in this chapter.

SENDING TEXT

1. At this point, the program instructions should say, "First, select the lettering tool." **Move the pointer to the large A** (several boxes above the filled rectangle tool).
2. **Click** on the A.
3. **Move the pointer inside the drawing area**, not too close to the top, where you want to start a title — somewhere below the level of the lettering tool is best. **Click the mouse button** (press C).
4. The pointer changes to a text cursor. The instructions say to type your title and press RETURN.

Try pressing keys or sending text: nothing will happen. *When you are in mouse emulation mode, you can emulate the mouse but you can't emulate the keyboard. To emulate the keyboard, you must exit mouse mode.*

EXITING MOUSE MODE

There are several ways to exit and re-enter mouse mode. Which one works best is partly determined by your application program.

Exit to Keyboard Emulation

1. To exit to keyboard emulation, **press Q** (for Quit). The bottom of the screen will provide a prompt:

LEAVING MOUSE/JOYSTICK MODE

(PRESS ANY KEY)

2. **Press any key.** You are now back in keyboard-emulation mode. (In the demo, press a few letters to see that you can now send text, but do not press RETURN.)
3. **To re-enter mouse mode, use the MOUSE/JOYSTICK character.**

Exit to Temporary Text Mode

4. In a situation where you just want keyboard emulation for a few letters (as in the Mouse Demo), you can save time and keystrokes in this way:

- (1) **Press ESC to exit to a temporary text mode**
- (2) **Press the letters you want for text**
- (3) **Press RETURN.**

Pressing RETURN from temporary text mode automatically sends RETURN to the program *and* returns you to mouse mode. (In the demo, press any letter which moves the pointer in steps: you won't get text — instead, the pointer will move, because you are back in mouse mode.

To exit temporary text mode *without* sending a RETURN to the application program, use the MOUSE character, rather than RETURN, to re-enter mouse mode.

5. You are close to the end of the demo program. **Press RETURN** (or click the FORWARD ARROW) **to go on.**
6. You'll proceed through a series of sample drawings. **Continue to press RETURN** (or click the FORWARD ARROW) **to go on.**

PREVIEW: USING A MOUSE MACRO

1. Ultimately, you'll come to a "Pop Quiz" — a chance to practice dragging words to blank lines. We'll use this to give you a preview of MOUSE MACROS. First, fill in one blank yourself to see what's involved:
 - (1) **Press TAB 1** to move the pointer to the 1st word, "diagrams."
 - (2) **Press B** to push the button down.
 - (3) **Press TAB 0** (zero) to drag the pointer to the last blank line.
 - (4) **Press X** to release the button.
2. To get you through the Pop Quiz quickly, we've stored a MOUSE MACRO to finish the test! **To use a mouse macro:**
 - (1) **Press the MACRO character for your input method.** (These are listed on the next page.)

Assisted keyboard ' \ '
Expanded keyboard: Unicorn MESSAGE square in row 2
TASH ' \ '
Morse code •••---
Scanning ' \ ' in the alphabet array
ASCII input.....ESC or CTRL-]

(2) Press the CODE NAME for the macro.

For this demo, watch what happens when you **press your MACRO character, then Q** (for Quiz).

3. In this demo, when you pressed MACRO Q, you saw the remaining four words move to their appropriate blanks.

To set up for the Pop Quiz, we set a TAB (1-5) on each of the five answer-words. We then set a TAB (6-0) on the five blank lines. We then created this mouse macro:

TAB 2 B TAB 7 X
TAB 3 B TAB 6 X
TAB 4 B TAB 8 X
TAB 5 B TAB 9 X

Optional: To try MACRO Q again, use TAB B and click on the BACK ARROW to move back a page. Use MACRO Q for the last four words; use TAB 1, press B, drag the pointer, and press X to take care of "diagrams."

Macros can be an ideal way to store a sequence of commands which you use frequently in an application. A tutorial for creating mouse macros follows this section. (You can use it next, or pick it up another day.)

4. When you complete the Pop Quiz, another Pop Quiz will appear on the screen. No tabs or macros are stored for this quiz. This concludes the Mouse Emulation Demo. If you complete the quiz, the Apple program will return you to the main menu. From there, you can select "Let's Stop" from the Quit title on the main menu bar.

Figure 18-1 provides a summary of AFC MOUSE EMULATION MODE commands.

Figure 18-1. Summary of AFC Mouse Emulation Mode Commands

ENTER/EXIT

Enter mouse mode = MOUSE/JOYSTICK character

Exit mouse mode = Q

THE BUTTON

click = C press & hold = B release = X

double click = : or ; shift-click = .

command-click = [option-click =]

THE CURSOR

large steps

W
A S
Z

medium steps

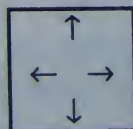
U
L R
D

small steps

I
J K
M

Pointer step size = P

smooth movement



or ROTATING ARROW = SPACEBAR

Figure 18-1 (continued)

MOUSE/JOYSTICK TABS

Set a TAB: TAB + TAB

Use a TAB: TAB + TAB NAME

Delete a TAB: TAB + CONTROL-X + TAB NAME

Set TEMPORARY TAB #1: F Set TEMPORARY TAB #2: N

Go to TEMPORARY TAB #1: G Go to TEMPORARY TAB #2: O

INSTANT MESSAGES

Add a MACRO: MACRO character + .

Use a MACRO: MACRO character + CODE NAME

List MACROS: MACRO character + ,

TEXT

Exit to Temporary Text Mode: ESC

Return to mouse mode: RETURN or MOUSE/JOYSTICK character

OR

Exit to keyboard emulation: Q

Re-enter mouse mode: MOUSE/JOYSTICK character

CREATING MOUSE MACROS

A macro is a string of characters or commands which may be retrieved which just a few keystrokes. The basic principles of creating and using AFC macros are discussed in Chapter 17. Used when in mouse mode, macros give you a way of simplifying the operation of a mouse-based program by letting you retrieve complex strings of mouse commands with as little as two keystrokes.

To create MOUSE MACROS, you may use the Macro Manager program or the Instant Message feature of the AFC to store strings of mouse commands under a CODE NAME.

This section will step you through using the Instant Message features to create mouse macros for more efficient use of the Apple demonstration disk. We assume you have completed the preceding Mouse Emulation Demo .

You will need the AFC, the AFC Menu Disk, the disk titled *Your Apple Tour of the Apple II*GS, and your input device.

If you have just completed the Mouse Emulation Demo, and the *Apple Tour* main menu is on the screen, you can skip "Loading the Setup" — go to "Example 1," below.

Loading the Setup

1. **Boot the AFC Menu Disk.**
2. **Load the MOUSE DEMO setup which you used earlier.** It will already be set to your method and rate.
3. When the SETUP IN EFFECT window appears, take out the Menu Disk and **put in the application disk, *Your Apple Tour of the Apple II*GS.** Press RETURN to boot the new disk.
4. After the window-shade title rolls down and up, **press ESC** to proceed directly to the main menu of the program.
5. **Enter mouse mode:** use the MOUSE/JOYSTICK character. When the prompt appears, press any key to continue.

Example 1: Pulling Down Menus

Using pull-down menus is typically very important in mouse-based application programs. The main menu of the *Apple Tour* shows a menu bar with five titles across the screen. If this were your application program, you would probably want a way to quickly tab to any of the titles on a menu and to pull down the menus.

For example, let's say you have three titles on the menu bar. You might want to mark them TAB X, Y, and Z (or any other lettering or numbering system)

1. Set TABS X, Y, and Z at the first three titles on the menu.

- (1) Move the pointer to the first title. The lower edge of the words, somewhere in the middle of the title, is best.
- (2) Press TAB two times.
- (3) Enter X for the TAB NAME for "Getting Started," then press RETURN.
- (4) Repeat the above to set TAB Y at "Can Do," and TAB Z at "How It Works."

2. Use the tabs to be sure they work correctly.

3. To pull down the menu for any of these titles, you must tab to the title, then press B for Button down. (Try this for one title, then press X to release the button.)

In an application program, it would be useful to have macros which both send the pointer to the title *and* press the button down. That way you could see and be ready to drag through the pull-down menu for any title with as few as two keystrokes.

A macro to pull down a menu would consist of:

TAB + TAB NAME (to tab to the correct title) + B (for Button down)

Let's create a macro which will pull down the menu for TAB Y ("What the IIGS Can Do").

4. To create a macro, press the AFC MACRO character, then press PERIOD (for create). A tone will sound for the MACRO character and for the PERIOD.

5. A prompt appears, asking you to enter the CODE NAME for the new macro.

TO ADD NEW MACRO,

PLEASE ENTER CODE NAME:

The macro can be 1-15 characters long. If your setup will use the ASCII-input method, please use a PERIOD as the last character in your CODE NAME. (Other tips for using CODE NAMES are discussed in Chapter 17.)

Since we are creating a macro which will tab to location Y, let's name the macro Y. **Press Y RETURN.**

6. The prompt changes to:

NOW TYPE MESSAGE:

The message we want to enter is 'TAB Y' (tab to location Y) then 'B' (for Button down), so

- (1) **press TAB** (an 'T' will print on the screen; in this case, I = TAB)
- (2) **press Y**
- (3) **press B**
note: do not use any SPACES.
- (4) when the message is complete, **press RETURN**

When the prompt disappears, the macro has been stored.

7. To check your work, **move the pointer away from the title, then press MACRO Y.**

The pointer should jump to the TAB Y location (the title), and the pull-down menu will appear, because 'B' was part of the message sent to the program. **Press X to release the button.**

In summary, you now have:

TAB Y: moves the pointer to location Y.

MACRO Y (TAB Y + B): moves the pointer to location Y *and* pulls down the menu.

8. Optional: Create a MACRO X (TAB X B). You can then use MACRO X or Y to pull down the menus for the titles "Getting Started" and "IIGS Can Do" respectively. (Please *don't* create a MACRO Z right now.)

Example 2: Choosing Commands from a Menu

Let's say you now have a mouse macro to pull down each of the menus on the main menu bar in your application. In the earlier Mouse Emulation Demo, we used the Graphics program from the "Can Do" menu. If this were your application program and you frequently chose to use Graphics, you might like a mouse macro which pulls down the "Can Do" menu, moves down the menu, and chooses the Graphics command.

1. **Press MACRO Y to pull down the "Can Do" menu.**
2. **Notice the position of the pointer. Use D (the medium step) to move the pointer down the menu. Notice the exact position of the tip of the pointer, relative to the letters.**

You'll see that the step size is not exactly matched to the steps in this menu. The reason is that we set the medium steps to match the boxes in the Graphics program. In this case, that size does not precisely match the steps in the main menu pull-down menus, but it seems to work.

3. **Count how many D's are needed to move the pointer from the MACRO Y position to the word "Graphics."** (It will most likely be 4, but it could be 5, if the starting position is higher than the bottom of the "Can Do" title.)
4. **Don't release the button yet. Move the pointer back to the "Can Do" title. Then press X to release the button.** (If you somehow get a new title page, click on Main Menu to get back to the main menu.)

5. We will create a macro which automatically pulls down the "Can Do" menu, moves the pointer to "Graphics," then releases the button. The macro will be:

```
TAB Y
B
DDDD (4 or 5 D's, whatever number you needed
      to get to the Graphics command)
X
```

6. To create the macro:

- (1) **Press MACRO, then PERIOD.**

The prompt will appear.

- (2) Let's name the macro 'G' (for Graphics.) **Press G RETURN.** The prompt will change.

- (3) Enter the following characters, in this order (with no SPACES):
TAB Y B D D D D (5th D if needed for your steps) **X**

- (4) When the message is complete, **press RETURN.**

7. Try using the new macro. **Press MACRO G.**

The two characters, MACRO + G, will choose the Graphics command, bringing the Apple II Graphics title page (or a yes/no page) onto the screen.

You wouldn't need a mouse macro for every command on every pull-down menu, but it would certainly be useful for the commands you use most frequently.

Using Message Rate to Slow Down Macro Retrieval

The AFC sent the message string, "TAB Y B D D D D X," to the computer *very* quickly. With some application programs, the program can't handle the string that quickly. Consequently, some characters get lost, and the macro doesn't do its job. For this reason, it's important to know you *can* slow down the message, if needed. Slowing down messages can have a side benefit also:

you can see more clearly how the messages work. This can help you diagnose problems if a macro isn't working properly.

We're going to back up, change the MESSAGE RATE, and use MACRO G again.

1. If the Apple II Graphics title page is on your screen,
use TAB M, then click to back up to the main menu.

If a yes/no page is on your screen,
use MACRO N to say "no."

2. Use **CONTROL-A 2** to bring up the AFC special options window.
3. Scroll through the special options window until the cursor is on **MESSAGE RATE**; press **RETURN**.
4. To slow down the MESSAGE RATE, **enter a lower setting, such as 10.** (29 = fastest rate, 1 = slowest.) **Press RETURN.**
5. To exit the special options window, **press ESC.**
6. The new setting for MESSAGE RATE is now in effect.
Send the macro again: **press MACRO G.**

The AFC will send the message string to the computer much more slowly. Let's keep the rate at 10 in this demo, to see better how the macros you create are executed.

Example 3: Zipping Through Preliminaries

1. You should now have the Apple II Graphics title page on the screen. If, instead, you have a yes/no page, use MACRO OK (for OK) to go on. (Sorry, we couldn't use MACRO Y for Yes, because we already used MACRO Y for the "IIGS Can Do" title.)
2. We would like to get quickly to the "rectangle tool" portion of this program, without having to go through it page by page. So we've stored a mouse macro under MACRO Z (for Zip — to zip you through it).

Press MACRO Z, and watch what happens.

The message executed by MACRO Z was:

TAB F C C C C TAB L C S S B S X F TAB F C G

3. Optional: To see that again, use **TAB M click** (to get back to the main menu), then **MACRO G** (to choose Graphics). If the yes/no page appears, press **MACRO OK** (for OK). When the Graphics title page appears, press **MACRO Z** (to Zip through the preliminaries).

To decode the message string, remember:

TAB F = FORWARD ARROW

C = click

TAB L = line tool

S = large step to the right

B = button down

X = release the button

F = fix temporary tab #1

G = go back to temporary tab #1

MACRO Z is an example of a fairly long message string (100 characters is the limit). Using a mouse macro to "get through preliminaries" is probably not a common application, but it could be useful occasionally.

Example 4: Executing a Common Sequence of Mouse Commands

Probably the most useful application of mouse macros is to execute common sequences of commands within an application program.

1. You should be on the screen where the instruction box reads, "Try it out. Click the rectangle tool."

Imagine that, in the middle of your drawing program, you want to draw a rectangle, starting where the pointer is now pointing. Imagine you will be doing this a lot, because you have a drawing in mind with lots of rectangles.

To review what we did in the Mouse Emulation Demo (*don't do it now*), you pressed:

F to set temporary tab #1 at the current pointer position,

TAB R to go to the rectangle tool

C to click on the tool

G to go back to temporary tab #1

2. Optional: If you don't recall how that worked, you can try it now, **then use TAB B click** to return to the page that says, "click the rectangle tool."
3. What we want to do is create a macro, **MACRO R** which will set temporary tab #1, click the rectangle tool, and go back to temporary tab #1. The message will be:

F TAB R C G

To create the macro,

- (1) **Press MACRO PERIOD.**
 - (2) **Enter the macro CODE NAME: R RETURN.**
 - (3) **Enter the message: F TAB R C G (with no SPACES)**
 - (4) **Press RETURN.**
4. Try using the new macro: **press MACRO R.**
- Remember, the message can be sent more quickly. We still have our MESSAGE RATE set to 10.
5. Optional: You can back up a page and use **CONTROL-A 2** to change the MESSAGE RATE to 29, the fastest rate. Then send **MACRO R.**

You'll see the macro executed quickly, but it won't necessarily work every time. In some cases, the pointer goes through the correct motions, but the program doesn't seem to get the entire message. This is an example of the speed of a macro being too fast for the application program. In this program, a MESSAGE RATE of 20 seems to be a safe upper limit.

Listing Macros

You may, while using a program, want to list the macros. For example, you might want to see if you've already used a certain letter as a CODE NAME.

1. **Press MACRO, then COMMA.**

The bottom of the screen will begin listing your macros, four at a time. The list will include macros that were previously saved in this setup plus

any new macros which you have created. The most recent additions will be shown first.

2. **Press SPACEBAR to continue through this list OR press ESC at any time to return to the application program.**

The MACROS that have been created in this setup are:

- G to choose Graphics from the "Can Do" menu
- N to choose "no" from the yes/no page
- OK to choose "yes" (OK) from the yes/no page
- Q to finish the Pop Quiz in the Mouse Emulation Demo
- R to fix temporary tab #1, click on the rectangle tool, and go back to temporary tab #1
- X to pull down the "Getting Started" menu
- Y to pull down the "Can Do" menu
- Z to Zip through the preliminaries

This concludes the tutorial for using the AFC's Instant Message feature to create and use mouse macros. You can continue to practice in the Graphics demo program, or you can use TAB M and click to return to the main menu. From there, you can select "Let's Stop" from the Quit title on the menu bar to quit.

For information on editing, deleting, or saving macros in the Instant Message program, see Chapter 17. Chapter 17 also includes detailed information and a tutorial on using the Macro Manager, a program which lets you create and edit macros for both text and mouse/joystick applications in a powerful, full-screen environment. It also lets you create and edit mouse/joystick tabs. You can list any of these on the full screen or send them to a printer. You can also use the Macro Manager program to add speech feedback to your macros or tabs and to adjust the amount of memory allocated for adding instant messages in your setup. (See "Using the Macro Manager," Chapter 17.)

Macro commands are included in Figure 18-1, earlier in this chapter.

ADDING MOUSE EMULATION TO YOUR SETUP

To use AFC mouse emulation with a setup:

- (1) the overlay must include the AFC.MOUSE/JOYSTICK *character* and
- (2) the *special option* of MOUSE/JOYSTICK must be on.

To check the mouse emulation capability for a setup: bring up the Choices window, select Get More Information, then select Vital Statistics.

If the Vital Statistics window shows "mouse emulation" is YES, then the MOUSE/JOYSTICK character is in the overlay and the option is on. You can load the setup and use the MOUSE character to enter mouse mode.

If "mouse emulation" is OFF, the overlay includes the MOUSE/JOYSTICK character, but the special option of MOUSE/JOYSTICK has been turned off. Use the Make Changes ... Special Options window to turn MOUSE/JOYSTICK on.

If the "mouse emulation" is NO, the MOUSE/JOYSTICK character is not in the overlay: you can use the Make Changes ... Overlay window to edit the overlay and add the character. For help editing your overlay, see Chapter 7. (For scanning, see the chapter titled SCANNING.) To insert the MOUSE/JOYSTICK character:

- (a) Indicate item user will select.
- (b) For COMPUTER RECEIVES, press ESC and select AFC.MOUSE from the special-character window.
- (c) Return to the Create Overlay Main Menu, select Test/Save/Quit, then select SAVE TO DISK.

To use macros with mouse emulation:

- (1) the overlay must include the AFC.MACRO *character* and
- (2) the *special option* of AFC.MACROS must be on.

Options for Smooth Movement: Arrow Keys

The following AFC special options allow you to adjust the speed of pointer movement and the method for handling the moving pointer. As sub-options of the ROTATING ARROW option, they do double-duty in adjusting both ARROW key and ROTATING ARROW parameters.

You can use CONTROL-A 2 to change the settings, provided the special option of ROTATING ARROW is on. (If it's not, use the Make Changes ... Special Options window. If you later want to de-activate the rotating arrow, use the Make Changes window to turn that option off. The changes you made in rate and method will remain in effect for the ARROW keys.)

| | |
|--------------------|---|
| ROTATING
RATE | Lets you adjust the rate of the rate of pointer movement without changing the rate of your input method. 0 = slowest rate, 29 = fastest. The default rotating rate is tied to the rate for the method in that setup. |
| ROTATING
METHOD | Lets you set the method you use to handle the moving pointer. 0 = select the ARROW character and hold the key or switch down to keep the mouse/joystick pointer moving continuously in the direction of the arrow. 1 = you select the ARROW character, then release the key/switch to start the pointer moving, press the key/switch again to stop it. You press again to continue movement or wait until you hear a tone to exist movement-mode. |

Options for Smooth Movement: Rotating Arrow

The following AFC special options allow you to customize various features of the ROTATING ARROW, including its size, rate, and contents. If you don't want a rotating arrow in your setup, use Make Changes ... Special Options to turn ROTATING ARROW off.

| | |
|--------------------|--|
| ROTATING
METHOD | Lets you set the method you use to interact with the rotating arrow. 0 = hold the switch or SPACEBAR down to keep the mouse/joystick pointer moving continuously in the direction of the arrow. 1 = you press the switch/SPACEBAR to start the pointer moving, press the switch/SPACEBAR again to stop it. |
|--------------------|--|

| | |
|--------------------|--|
| ROTATING
RATE | Lets you adjust the rate of the rotating arrow and the rate of pointer movement without changing the rate of your input method. 0 = slowest rotation rate, 29 = fastest. The rate of pointer movement is also affected by the small step size. |
| ROT.
LOCATION | Lets you place the arrow in any of 8 locations around the edge of the screen. 0 = lower left corner, 1 = low center, 2 = lower right corner, 3 = right side center, etc. |
| ROT.
DISPLAY | Lets you adjust the appearance of the rotating arrow. 1 = normal display mode, 2 = large rotating arrow, 3, 4 = alternate display modes. |
| ROT.
DIRECTIONS | Lets you select the directions covered by the rotating arrow. 0 = left/right only, 1 = up/down only, 2 = four directions. |
| ROT.
BUTTONS | Lets you set the button choices included with the rotating arrow. 0 = X (exit, C (click). 1 = X, C, C2 (click 2nd joystick button). 2 = X, C, B (hold button down). 3 = X, C, B, * (double-click). |

Saving Changes

When using mouse emulation, any changes you make in the pointer step-size, or any additions or changes you make with mouse tabs or macros, will be immediately active in the setup and will be saved as part of the copy of the setup that is on your Adaptive Firmware Card. However, unless you deliberately save these changes on the Menu Disk, they will be lost if:

- you reinitialize the card by booting the Menu Disk with the AFC turned OFF. (If you boot the Menu Disk with the AFC turned ON, the card is not reinitialized.)
OR
- the setup is moved off the Quick-Start Menu when extra memory is needed by or for other setups (see Chapter 4)

To back up important additions or changes, use CONTROL-A 3 to save the changes on the Menu Disk. Do this when you are ready to quit the application program and while the setup is active.

SUMMARY OF MOUSE EMULATION

For a setup to be capable of mouse emulation, the overlay must include the AFC.MOUSE character, and the special option of MOUSE/JOYSTICK must be on. Use the Get More Information ... Vital Statistics window to check if "mouse emulation" is YES, OFF, or NO for a particular setup.

To enter mouse mode, use the AFC.MOUSE character.

Use letters, ARROWS, or SPACEBAR to move the pointer.

IJKM = small steps

WASZ = large steps

ULRD = medium steps

P = change step size

ARROWS = smoothly moving pointer

SPACEBAR = ROTATING ARROW for switch or SPACEBAR control of smoothly moving pointer.

Use characters to emulate the mouse button.

C = click

B = button down

X = release button

COLON or SEMI-COLON = double-click

PERIOD = shift-click

[= command-click

] = option-click

Use MOUSE TABS to move the pointer quickly to a preset location.

Set tab = TAB + TAB + NAME

Use tabs = TAB + NAME

Use TEMPORARY TABS to mark current position for quick return.

Set temporary tab #1 = F

Set temporary tab #2 = N

Use temporary tab #1 = G

Use temporary tab #2 = O

Use MACROS to execute complex mouse procedures.

To exit mouse mode, use Q to quit.

CHAPTER 19

EMULATING THE PADDLES OR JOYSTICK

| | |
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| Joystick Mode versus Paddle Mode..... | 19-3 |
| Using Special Options to Fine-Tune the Setup..... | 19-5 |
| Creating Your Own Joystick/
Paddle Emulation Setup..... | 19-8 |
| Using Macros to Accomplish Special Effects | 19-10 |

CHAPTER 19

EMULATING THE PADDLES OR JOYSTICK

This chapter will provide information on AFC joystick/paddle emulation, which is substantially different from the paddle emulation provided by the earlier AFC System Software 2.3 (for the Apple IIe). The System Software 4.0 joystick/paddle emulation works with a wide range of application software and can be used with any AFC input method. We assume you are familiar with AFC mouse emulation (Chapter 18), but you can read this chapter first, if you prefer.

Most application software uses keyboard input. To allow you to run this software by means other than the keyboard, the AFC provides **keyboard emulation**: when you use scanning, Morse code, an expanded/minature keyboard, or a communication device, **the AFC tricks the computer into "thinking" you are using the keyboard when you're not.**

Keyboard emulation, however, cannot help if the application software does not use the keyboard. If the program makes use of a mouse, you need **mouse emulation**. If it makes use of a joystick or paddles, you need **joystick/paddle emulation**.

The AFC with System Software 4.0 is capable of emulating a joystick or a set of game paddles, in much the same way that it can emulate the mouse. In fact, from the standpoint of the user, there is little, if any difference, between mouse emulation and joystick/paddle emulation. To use joystick/paddle emulation:

1. **Use a setup which has the mouse/joystick capability, ie., its overlay contains the AFC.MOUSE/JOYSTICK character and the special option MOUSE/JOYSTICK is ON.**

If a setup does not include the AFC.MOUSE/JOYSTICK character, you can add it to the overlay through the Make

Changes ... Overlay window. For help in editing an overlay, see Chapter 7 or the chapter for your input method.

2. Use the Make Changes window or CONTROL-A 2 to **change the special option of POINTING.DEVICE to 1** (for joystick) or **2** (for paddles).

The difference between these two settings will be explained later in this chapter.

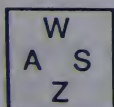
3. After starting up the application, **send the AFC.MOUSE character to enter MOUSE/JOYSTICK MODE.**
4. Once you enter mouse/joystick mode, a variety of commands and features become available to emulate the joystick/paddles, as described below.

COMMANDS AND FEATURES

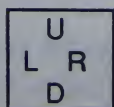
All of the following commands and features, except the 'V' command, are also available in mouse emulation and are described in detail Chapter 18.

Certain letter keys move the joystick pointer up, down, left, right by steps:

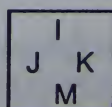
large steps



medium steps



small steps



[P] lets you adjust the Pointer step sizes.

The four **ARROW** characters and the **ROTATING ARROW** function (SPACEBAR) are available for smooth movement of the joystick pointer.

[C] clicks (presses and releases) game button 0.

[B] holds down game button 0.

☐ X releases game button 0.

☐ V clicks (presses and releases) game button 1.

TABS are available for paddle mode, but not for joystick mode. This includes the TEMPORARY TAB functions, F – G, N – O.

MACROS containing the above characters will execute joystick/paddle commands if retrieved when mouse/joystick mode is active, on a par with mouse macros.

For more detail and a hands-on demo of these mouse/joystick functions, see Chapter 18, EMULATING THE MOUSE.

JOYSTICK MODE VERSUS PADDLE MODE

The two *modes* of joystick/paddle emulation offered by the AFC are called JOYSTICK and PADDLE, respectively. In actual use, the one you use for a particular program will probably depend more on experimentation than on anything else.

Technically speaking, there is no real difference between a joystick and a set of game paddles. As far as the computer is concerned, a joystick is two game paddles which are rotated by using a lever (the joystick). Moving the joystick right and left rotates one paddle; moving it forward and back rotates the other paddle.

However, there *is* a real difference in the way different programs make use of a joystick or paddle. Essentially, the difference is this:

- A typical program which calls for a **joystick** uses the joystick like the gas pedal of a car or like the joystick on a wheelchair: an object keeps moving only as long as the joystick is pushed off-center. *When the joystick is in its at-rest position, the object will stay where it is but stops moving.* Thus, the actual location of the object is not related to the position of the joystick.
- A typical program which calls for **game paddles** uses the paddles like the knobs on an Etch-a-Sketch: the location of the movable object is based on the 'absolute' position of the paddles (or joystick)

lever). An object keeps moving as long as the paddles (or joystick) are moved, but *when the paddles (or joystick) are brought back to the original at-rest position, the object will move back to its original location.*

Unfortunately, this usage is by no means consistent. Many programs which call for a "joystick" will use it to control an object's position directly — the function normally ascribed to "paddles." Nonetheless, rather than invoke technical jargon (ie. "relative" versus "absolute" pointing devices), we have decided to use the terms JOYSTICK and PADDLE to describe the two different modes of joystick/paddle emulation which are necessary to accommodate both types of programs.

Summary: Joystick Mode versus Paddle Mode for the AFC

JOYSTICK MODE: gas pedal or wheelchair

return joystick to at-rest position → object stays in place but stops moving

PADDLE MODE: Etch-a-Sketch

return paddles/joystick to at-rest position → object returns to original location

To decide which mode is appropriate, we suggest you start with the mode which matches the device called for by the program. If this doesn't work correctly, try the other one.

- If you use the joystick mode for a program which should be run using the paddle mode, you will see the joystick-controlled object jump to one side of the screen for a moment and then jump back to the center each time you press an ARROW key.
- If you use the paddle mode for a program which should be run using the joystick mode, you will probably find that nothing happens as you press an ARROW repeatedly. Finally, however, after you hold down the ARROW key for a few seconds, the object will begin moving in a given direction and doesn't stop!
- Sometimes a program will use joystick or paddles in a reversed orientation. In this case, a RIGHT ARROW may move the object to the left, and vice versa, or an UP ARROW may move the object to the right. If this happens, you have probably selected the correct mode

of joystick/paddle emulation, but you may wish to redefine some of the characters in the overlay of your setup.

USING SPECIAL OPTIONS TO FINE-TUNE THE SETUP

Once you have set the correct mode for your setup — joystick mode (POINTING.DEVICE = 1) or paddle mode (POINTING.DEVICE = 2) — keep in mind that several AFC special options are available which may help "fine-tune" the setup to your application program. All the special options are listed in Chapter 5. The list below are those that particularly apply to joystick/paddle emulation.

| | |
|-----------------|---|
| SLOWDOWN | May be used to make any interactive program run more slowly. 0 = no slowdown, 255 = maximum slowdown. This can be particularly helpful in high-speed arcade-type programs. See demo in Chapter 5. |
|-----------------|---|

| | |
|-------------------------|---|
| MESSAGE
RATE | Lets you adjust the rate at which the AFC sends strings of characters, including text macros or mouse/ joystick macros to the application program. With joystick/paddle emulation, adjusting this option can be useful when a setup uses interruptible macros to move the joystick pointer through choices. In this case, the MESSAGE RATE adjusts the pointer speed. 0 = slowest rate, 29 = fastest rate. This option appears only if the overlay includes strings of characters or the AFC.MACRO character. Part of demo in Chapter 18. |
|-------------------------|---|

| | |
|----------------------------|---|
| MOUSE/
JOYSTICK | Turning this on (= 1) lets you use this setup (method, rate, overlay, etc.) to emulate not only the Apple keyboard but a pointing device, such as the mouse, joystick, paddles, etc. This option does not appear if the AFC.MOUSE/JOYSTICK character is not part of the overlay. The setting can only be changed from the Make Changes window. Emulation of the joystick or other pointing devices is described in this chapter. For mouse emulation, see Chapter 18. |
|----------------------------|---|

| | |
|-----------------|---|
| I DEVICE | Set this to the device you want to emulate. 0 = mouse, 1 = joystick, 2 = paddles. |
|-----------------|---|

| | |
|--------------------|--|
| ADJUSTMENTS | Turn this on (=1) to show or off (= 0) to hide CLICK LENGTH, STEP SIZES, and the JOYSTICK ADJUSTMENT options described below. You can only turn this on/off from the Make Changes window. |
| CLICK LENGTH | This specifies how long the AFC should hold down the game buttons. If the program doesn't "hear" the AFC click the button ('C' or 'V'), try a longer setting. 0 = shortest, 255 = longest. |
| SMALL
 UP/DOWN | Adjusts the distance moved by the mouse/joystick pointer in its small up/down steps. 0 = smallest, 255 = largest.

Note: All of the step sizes (small, medium, and large) may be adjusted using the step size command, 'P', while in mouse mode. (See Chapter 18.) |
| SMALL
 LEFT/RT | Adjusts the distance moved by the pointer in its small left/right steps. 0 = smallest, 255 = largest.

The small steps sizes above are also used when you move the pointer smoothly by means of ARROW keys or the rotating arrow, described below. One way to make the pointer move more quickly is to increase the small up/down and small left/right step sizes. Another way is to adjust ROTATION RATE, described under ROTATING ARROW. |
| MED.
 UP/DOWN | Adjusts the distance moved by the pointer in its medium up/down steps. 0 = smallest, 255 = largest. |
| MED.
 LEFT/RT | Adjusts the distance moved by the pointer in its medium left/right steps. 0 = smallest, 255 = largest. |
| LARGE
 UP/DOWN | Adjusts the distance moved by the pointer in its large up/down steps. 0 = smallest, 255 = largest. |
| LARGE
 LEFT/RT | Adjusts the distance moved by the pointer in its large left/right steps. 0 = smallest, 255 = largest. |
| JOYSTK ADJUST | The two JOYSTK ADJUST options are the AFC equivalent of adjusting the two centering adjustment knobs on the joystick. When this option and the one below it are set correctly, the figure in your joystick program will be at rest. Range = 0-255. Recommended setting = 130. |
| JOYSTK ADJUST | This is the AFC equivalent of joystick adjustment knob #2. Range = 0-255. Recommended setting = 130. |

**ROTATING
ARROW**

Turning this on (=1) means you can use SPACEBAR in mouse/joystick mode to bring up a ROTATING ARROW. The rotating arrow lets you move the mouse/joystick pointer smoothly in the direction shown by the arrow. You also need this option on to make adjustments in method or rate for smooth-movement ARROW keys. The setting can be changed only from the Make Changes window.

| METHOD

Lets you set the method you use to interact with ARROW keys *or* the rotating arrow. 0 = hold the switch or key down to keep the mouse/joystick pointer continuously moving in the direction of the arrow. 1 = you press the switch/key to start the pointer moving, press the switch/key again to stop it.

| RATE

Lets you adjust the rate of the rotating arrow and the rate of smooth pointer movement (for the ARROW keys *or* rotating arrow) without changing the rate of your input method. 0 = slowest rotation rate, 29 = fastest rotation rate. The rate of pointer movement is also affected by the small step size, described on page 19-6.

| LOCATION

Lets you place the arrow in any of 8 locations around the edge of the screen. 0 = lower left corner, 1 = low center, 2 = lower right corner, 3 = right side center, etc.

| DISPLAY MODE

Lets you to adjust the appearance of the rotating arrow. 1 = normal display mode, 2 = large rotating arrow, 3, 4 = alternate display modes.

| DIRECTIONS

Lets you select the directions covered by the rotating arrow. 0 = left/right only, 1 = up/down only, 2 = four directions.

| BUTTONS

Lets you set the button choices included with the rotating arrow. 0 = X (exit), C (click). 1 = X, C, C2 (click 2nd joystick button). 2 = X, C, B (hold button down). 3 = X, C, B, * (double-click).

CREATING YOUR OWN JOYSTICK/ PADDLE EMULATION SETUP

Creating your own setup for joystick/paddle emulation involves the following steps:

1. Learn the application software.

As described in Chapter 7, this means making a list of all keys and key combinations needed to run the program. The best way to do this is to use the program (or have a friend use it) with the "expected" input method — the Apple keyboard, mouse, joystick, paddles, etc. List all the characters, movements, or commands that are needed.

2. Decide whether you really want joystick/paddle emulation.

Many programs which call for a mouse, paddles, or joystick also have "keyboard equivalents" which you can use. *In general*, keyboard emulation is simpler to do than mouse, paddle, or joystick emulation. If keyboard equivalents are available, consider keyboard emulation rather than other types of emulation.

Similarly, *in general*, mouse emulation is quicker to implement than joystick/paddle emulation. If the program offers mouse control, consider mouse emulation rather than joystick/paddle emulation.

This is not to say you should avoid joystick/paddle emulation or that it will be difficult to implement, just that you may want to consider all the emulation possibilities before starting in on one.

3. If you decide to use joystick/paddle emulation, **decide on a plan of operation.** Would the program be most efficiently run by means of

- **characters in an overlay**, such as ARROW keys, C to CLICK, etc.
- **a rotating arrow**, which can include game button commands
- **macros** which send strings of commands when a switch is pressed or when certain characters are selected
- **or a combination** of any of the above?

Note: the rotating arrow can be a very immediate way of emulating a joystick or paddles, because you can tailor the location, size, directions,

and buttons within the rotating arrow to your program. For example, if a program only calls turning a paddle left and right and clicking the paddle button, your rotating arrow can display < > C for these three choices. You can display the rotating arrow in any of eight locations around the edge of the screen, and you can make it a large size, if the application program uses full-screen graphics.

4. **Design the overlay, rotating arrow, and/or macros. Be sure to include the AFC.MOUSE/JOYSTICK character in the overlay.** You will need this character in order to enter mouse/joystick mode. If you plan to use macros, include the AFC.MACRO character in the overlay.
5. **Consider whether you already have a setup which meets your needs or which could be easily modified.** You do not necessarily have to create a new setup "from scratch" for every joystick/paddle-based program.

If you already have a setup on your Menu Disk which meets your needs, you're done! If you have a setup that is similar, use CONTROL-C to copy the setup, use the Make Changes window to change the title or description, then make whatever changes are needed to tailor this setup to your new application.

Note: With the SETUP-TRANSFER capability of the AFC Menu Disk, we anticipate that AFC users will be able to easily share setups with other users, by copying setups from disk to disk or by transferring setups via a modem. (See "Other Options ... Transfer Setups," in Chapter 6 or see "Other Options" at the end of the Extended Menu.)

6. To create a new setup "from scratch":

A. Select ADD A SETUP at the end of the Extended Menu.

1. Select your method.
2. Create the overlay. Be sure to include the AFC.MOUSE/JOYSTICK character. (For help, see Chapter 7.)
3. If you include the AFC.MACRO character in the overlay, when you "quit" the Overlay-Create program, you will the option to work with macros. You can create them now (with the Macro Manager program) or later (with Macro Manager or Instant Message). (For help, see Chapter 17.)

4. After saving the setup and quitting the Overlay-Create or Macro Manager program, you will return to the Extended Menu.
- B. Use the Make Changes ... Special Options window to set POINTING.DEVICE = 1 (for joystick mode) or = 2 (for paddles mode). If you know of other changes you want to make in special options, you can do so at this time.
- C. Load the setup and try it with your application program.

Use the MOUSE/JOYSTICK character to enter mouse/joystick mode. Try out your overlay, rotating arrow, or macros while in joystick mode. Use 'P' to change any of the pointer step sizes. Use CONTROL-A 2 to make changes in rotating arrow parameters (method, rate, location, display mode, directions, buttons). You can also use CONTROL-A 2 to adjust SLOWDOWN (of the application program), MESSAGE RATE (for macros or any strings in the overlay), or POINTING DEVICE.

USING MACROS TO ACCOMPLISH SPECIAL EFFECTS

If you have used paddle emulation with AFC System Software 2.3 (for the AFC Model 2e), you will recognize that the present emulation method represents a radical departure. In general, the joystick/paddle emulation in AFC System Software 4.0 is a major improvement: programs which used the joystick as an equivalent of the mouse (such as Grandma's House™, by Spinnaker) could not be used at all with AFC System Software 2.3, but now work quite well with System Software 4.0. On the other side, however, the previous methods of AFC paddle emulation offered a more direct connection between user and program, because switch closures moved the paddles directly rather than via special characters. But these more direct methods are not lost in System Software 4.0 — they may be duplicated by using AFC macros. The following setups use advanced macros (invisible to the user) in joystick/paddle emulation mode to achieve the very simple effect of a directly controlled, switch-input program!

- The setup EDMARK RDG (for the Edmark Reading Program, by Edmark Corporation) contains a macro which operates as follows: Press the switch to start. The macro you send when you press the

switch causes the cursor to move slowly back and forth at a rate which can be changed by changing the special option of MESSAGE RATE. Press the switch again to click paddle button 0. This setup will also work with Stickybear Shapes (by Weekly Reader Family Software).

- The setup SB OPPOSIT (for Stickybear Opposites) uses paddle emulation with two switches as follows: Each time that switch #1 is pressed, game button 0 is clicked, selecting a new scene. Each time switch #2 is pressed, the game paddle is rotated to its opposite extreme, selecting the opposite concept in the present scene. These effects are obtained by a complex macro which simply rotates the paddle from one extreme to the other with each switch press.
- The setup ARCADE was designed for a common type of arcade game, which uses one paddle to move an object, such as a spaceship, and the paddle button to fire bullets at incoming invaders. This setup employs paddle emulation with two switches: switch #1 clicks game button 0, firing bullets at the invaders. Switch #2, when held down, moves the space ship to the right; then, when the switch is released and pressed again, to the left, and so forth.

Chapter 20 will describe ADVANCED MACROS in more detail.

CHAPTER 20

ADVANCED USE OF MACROS

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CHAPTER 20

ADVANCED USE OF MACROS

As we saw in the mouse emulation tutorial in Chapter 18, you can create macros which, when executed, will cause the AFC and/or computer to perform a series of predefined functions. In this sense, a macro may be thought of as a sort of "mini-program." In this chapter, we will introduce ways in which this idea can be carried further, with the help of a rudimentary "programming language." If you have had some experience with programming in Basic or Pascal, you will probably have fun with the AFC macro programming language. Otherwise, you may wish to read this chapter just for the idea of what's possible, then enlist the help of a programming friend to actually try out the ideas presented.

The goal in creating an AFC setup is to create an efficient-as-possible interface between user and application. The AFC's macro programming capability will give you a powerful tool to accomplish this goal. However, please be advised that this so-called "programming language" is very rudimentary and limited in many respects — we suggest an adventurous, pioneering spirit in tackling it.

Please keep in mind that this chapter is only an introduction! Detailed technical information is beyond the scope of this manual. For more complete information, contact Don Johnston Developmental Equipment, Inc. for the supplementary booklet, "Programmer's Guide to the AFC's Macro Programming Capability."

Summary of Programming Commands

The AFC's macro programming commands are contained in the last half of the list of special characters which you may insert in your macros. (This list begins with ESC, RETURN, OPEN-APPLE, etc.) When you use the Macro Manager program to create macros, these special characters and programming commands are displayed in a fairly readable form, both in the list of characters to insert and in the macros themselves. When you use the

Instant Message program, however, these commands appear in the special character list in a much abbreviated form; and within the macros themselves, they are represented as cryptic combinations of @ (at sign) plus *character*. Figure 20-1 summarizes the macro programming commands.

Figure 20-1. Summary of the AFC's Macro Programming Commands.

| Command in Macro Manager Special Character List | Command in Instant Message Special Character List | Representation in Macro (Instant Message) | Purpose |
|---|---|---|---|
| AFC.MACRO | MACRO | @I | Call another macro (comparable to GOSUB). |
| GOSUB | GOSUB | @I | Identical to AFC.MACRO. More familiar name for programmers. |
| GOTO | GOTO | @G | Call another macro and don't come back. |
| WHILE PRESSED | W.PRS | @1 | While switch is being pressed, do ... |
| WHILE NOT PRESSED | W.NP | @0 | While switch is not being pressed, do ... |
| (START LOOP ... | (| @(| Start of do loop. |
| ... END LOOP) |) | @) | End of do loop. |
| FOR I = 1 TO ... | FOR I | @I | Combine with number N to execute loop N times. |
| FOR J = 1 TO ... | FOR J | @J | Combine with number N to execute loop N times. |

Figure 20-1, continued. Summary of the AFC's Macro Programming Commands.

| Command in Macro Manager Special Character List | Command in Instant Message Special Character List | Representation in Macro (Instant Message) | Purpose |
|---|---|---|---|
| WHILE X < ... | X< | @R | Combine with CODE NAME of tab to set right boundary for mouse movement right. |
| WHILE X> ... | X> | @L | Combine with CODE NAME of tab to set left boundary for mouse movement left. |
| WHILE Y < ... | Y< | @C | Combine with CODE NAME of tab to set bottom boundary for mouse movement down. |
| WHILE Y > ... | Y> | @U | Combine with CODE NAME of tab to set top boundary for mouse movement up. |
| SUBSTITUTE | SUBST | @* | Combine with I J, K, P or C. Substitute the value of an index (I, J, or K) or switch-press status (P) or character input (C). Permits conditional branching if used in macro code name. |
| SET K = | K= | @K | Combine with number from 0 to 255 to set K index |
| INCREMENT K | ++K | @+ | Increment K index. |
| DECREMENT K | --K | @- | Decrement K index. |
| AND | & | @& | Logical AND of conditions. |
| BIP | BIP | @! | Make brief high-pitched tone. |
| BOP | BOP | @# | Make brief low-pitched tone |

Figure 20-1, continued. Summary of the AFC's Macro Programming Commands.

| Command in
Macro Manager
Special Character
List | Command in
Instant Message
Special Character
List | Represent-
ation in
Macro
(Instant
Message) | Purpose |
|--|--|---|--|
| SHOW CURSOR | SHOW | @\$ | Use with mouse/joystick
mode active and
POINTING.DEVICE = 3.
Highlights X,Y position. |
| FLASH LOCATION | FLASH | @% | Combine with tab CODE
NAME plus a number (length)
to highlight rectangle. |
| CLEAR HILITE | CLEAR | @_ | Undo SHOW CURSOR or
FLASH LOCATION. |
| SMOOTH RIGHT | > | @> | Move mouse to right by small
step, with reduced delay. |
| SMOOTH LEFT | < | @< | Move mouse to left by small
step, with reduced delay. |
| SMOOTH UP | ^ | @^ | Move mouse up by small
step, with reduced delay. |
| SMOOTH DOWN | v | @v | Move mouse down by small
step, with reduced delay. |
| AFC.NULL | NULL | @j | Does nothing. Could be used
for delay. |
| COMPRESSED MODE | CMPRS | @D | Permits use of regular
characters instead of special
characters for programming
commands. |

Text Macros versus Mouse/Joystick Macros

There is no real difference between text macros and mouse/joystick macros. A mouse macro is simply a text macro which is used while in mouse mode. If you use it when *not* in mouse mode, you will simply get a string of ordinary characters, such as "RRRDC".

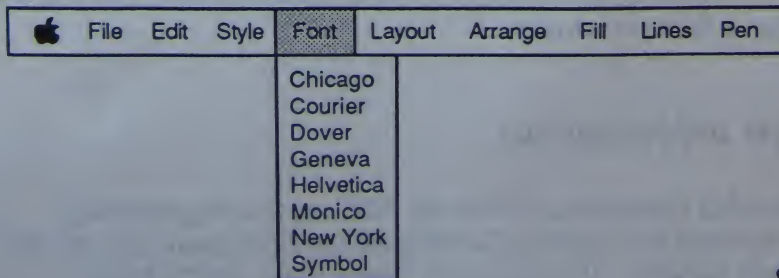
For some applications, notably word processors, it is desirable to operate in text mode at most times, using mouse emulation only for particular tasks, such as changing a font. In this case, it is possible to create macros which are mixed text and mouse, simply by including the special character AFC.MOUSE within a macro to enter mouse mode and, later, the letter Q to exit mouse mode and return to text mode. Incidentally, when embedded in a macro, these special commands will do their job with a minimum of fanfare. That is, the prompts "Entering mouse mode," etc. will not appear.

Practical Example: PULL-DOWN MENUS

For a program which uses pull-down menus, the macro described below could be very useful to a single-switch user. The macro makes use of two tab locations.

Define a tab in the upper left corner of the screen, and give it the CODE NAME AA. Next, set a tab BB at the diagonally opposite corner of a rectangle which is big enough to include all menus in their pulled-down state. (Note: if you use the Macro Manager to create the macros, you should create the macros first, then set the tabs when you go into the application.)

AA



BB

Now create these macros (remember that the () are special characters, not ordinary parentheses):

RL = WHILE X < BB (SMOOTH RIGHT) WHILE X > AA (SMOOTH LEFT)

DU = WHILE Y < BB (SMOOTH DOWN) WHILE Y > AA (SMOOTH UP)

WT = WHILE PRESSED ()

HZ = WHILE NOT PRESSED (GOSUB RL) GOSUB WT

VL = WHILE NOT PRESSED (GOSUB DU) GOSUB WT

MNU = TAB AA B GOSUB HZ GOSUB VL C

Explanation:

RL moves to the right until it reaches the BB boundary, then moves back to the left until it reaches AA.

DU moves down, then up, within boundaries defined by BB and AA.

WT waits until the switch is released.

HZ moves the cursor back and forth horizontally until the switch is pressed and released.

VL moves the cursor up and down vertically until the switch is pressed and released.

MNU is the combined result. It tabs to the AA location, pushes the button down, then drags across and down in response to user switch presses. Finally, it releases the button (via "Click") on the selected menu item.

Comments: by adjusting MESSAGE RATE and small step sizes you can make the cursor move faster or slower.

For More Information

For more detailed information about the AFC macro programming capability, contact Don Johnston Developmental Equipment, Inc. for the supplementary booklet, "Programmer's Guide to the AFC's Macro Programming Capability."

CHAPTER 21

COMMAND/OPEN-APPLE AND OPTION/SOLID-APPLE KEYS

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CHAPTER 21

COMMAND/OPEN-APPLE AND OPTION/SOLID-APPLE KEYS

Many programs require the use of the COMMAND (or OPEN-APPLE) key and the OPTION (or SOLID-APPLE) key. The AFC special characters OPEN-APPLE and OPTION/SOLID-APPLE, which are available for all AFC methods, emulate these keys. However, the way in which these keys are used differs from program to program.

In a nutshell, there are two distinct possibilities: these two APPLE keys may be used as *modifier keys*, the same way that the SHIFT and CONTROL keys are used, or they may be used as *momentary button inputs*, the same way that buttons on a joystick or game paddles, or switches connected to the Apple's Game I/O port are used.

The AFC can accommodate these differences by means of the special option called APPLEKEY. The setting for APPLEKEY can be changed only from the Make Changes window on the Extended Menu. (See "Make Changes ... Special Options," Chapter 6. For an overview of special options, see Chapter 5.)

Modifier Keys: LATCHING

Most programs that call for the OPEN-APPLE and SOLID-APPLE keys (such as AppleWorks) or the COMMAND and OPTION keys (such as new software for the Apple IIGS) will use them as *modifier keys*. This means that if you were using the standard Apple keyboard, and the software called for OPEN-APPLE-S, for example, you would *press and hold down* the OPEN-APPLE key, then press and release the key to be modified (the 'S' key), then release the APPLE key. You are, in effect, *latching* the OPEN-APPLE key while you press and release the key to be modified.

In this situation, if you are using the AFC, you would use APPLEKEY = 0: this is the LATCHING METHOD of APPLEKEY emulation. You send the APPLE character, followed by the character to be modified (in our example, OPEN-

APPLE, followed by 'S'). When APPLEKEY = 0 (latching), the APPLE character will *latch*, acting as if the APPLE key is held down, and will stay down while you send the next character. If you repeat the next character (for example, to send seven OPEN-APPLE RIGHT ARROWS in a row), the APPLE key will stay latched and will only pop up again when you send a *different* character.

For programs that do not want you to hold down the APPLE key in this way, read on.

Switch-Like Inputs: MOMENTARY

Technically speaking, the OPEN-APPLE and SOLID-APPLE keys (or COMMAND and OPTION keys, as they are labelled on the Apple II GS) are identical to, and function in parallel with, switches connected to the Game I/O port. This means that:

- (1) switch-input programs, which call for switches connected to the Game I/O, may be operated by means of the APPLE keys, and
- (2) some programs which call for use of the APPLE keys actually use them in much the same way that switch-based programs use switches — that is, they call for pressing a switch or button or key and releasing it momentarily. The key or button is not held down while another key is pressed and released.

With programs of this type, the computer is looking at the switch as a continuous input. How quickly the switch or APPLE key is released or how long it is held down is often important to successful operation of a program.

For example, one version of Bank Street Writer™ (by Broderbund) calls for pressing the OPEN-APPLE key momentarily to step through choices in the edit menu. If you hold the key down too long, the cursor will move continuously through the choices. Similarly in My Words (by Hartley), you use the OPEN-APPLE key to click on a word in the Word Bank. This causes the Echo Speech Synthesizer to say the word, but if you hold down the OPEN-APPLE key too long, the word is repeated continuously.

In other programs, the switch or APPLE key may need to be held down for a certain period to be recognized. With the AFC sending characters at its usual very rapid rate, the APPLE key closure may be too brief for the program to notice.

To make the AFC press and release the APPLE key or game button for a short time, use the Make Changes window to set `APPLEKEY = 1`, for the momentary method. (For help with the Make Changes window, see Chapter 6.) After you make the change, load the setup and try it with your application program.

DURATION OF THE MOMENTARY APPLE CHARACTER

If, after you load the setup and the application program, your APPLE characters seem to not "get through" to the program, it may be that the AFC is sending the APPLE characters more quickly than this program can recognize. To remedy this situation, the AFC special option of `DURATION` lets you specify how long the AFC should hold down the momentary APPLE characters. `DURATION` is a suboption of `APPLEKEY` and will only appear on your special options list when `APPLEKEY = 1` (the momentary `APPLEKEY` method).

The best way to adjust the `DURATION` suboption is to use `CONTROL-A 2` to experiment with the setting while using the application program. (For help with `CONTROL-A 2`, see Chapter 4.) The larger the `DURATION` setting, the longer the AFC will hold down the key. The default setting of 0 is approximately one-half second; 10 is approximately 5 seconds; 255 is approximately one minute.

Once you have found the proper `DURATION` setting for your program, and you are ready to quit your application, we suggest using `CONTROL-A 3` to save the new setting in the copy of the setup that is on your Extended Menu. (See page 4-25.)

Switch-Based Programs: DIRECT

The `LATCHING` and `MOMENTARY APPLEKEY` methods (0 and 1, respectively) are appropriate for programs which call for use of the APPLE keys along with other keys on the keyboard. In other words, these are essentially keyboard-based programs: to use them through an AFC method, you need keyboard emulation along with APPLE-key emulation. There is, however, another class of programs which does not use keyboard input but instead calls for:

- switches connected to the Apple's Game I/O or
- buttons on game paddles or on a joystick or
- OPEN-APPLE and SOLID-APPLE keys *exclusively*.

To run these programs (which we refer to as switch-based), keyboard emulation is not necessary. Instead, switches connected to the AFC I/O box may function nicely. Here the AFC acts as a **DIRECT SWITCH CONNECTION**.

For the normal-input method, with switches connected to the AFC I/O box or with an expanded keyboard used for two-half switch input, the direct switch connection already exists. Adjusting the APPLEKEY option is not necessary.

For the expanded keyboard and multiple switch box methods, set APPLEKEY = 2 (DIRECT) in order to use COMMAND/OPEN-APPLE and OPTION/SOLID APPLE keys (that is, any squares or switches defined as these in the overlay) directly.

For ASCII-input methods, switches connected to the AFC I/O box work directly, but there is no provision for using the ASCII device itself directly. Try using a momentary or latching scheme.

For the assisted IIGS keyboard, OPEN-APPLE and SOLID-APPLE keys will be governed by the APPLEKEY setting. Set APPLEKEY = 2 (DIRECT) to use these keys directly.

In scanning and Morse code methods, with APPLEKEY = 2, the switches will act in two different ways, depending on what the application program is doing.

- If the program is looking for *keyboard input only*, pressing a switch will cause the scanning array to appear, etc.
- If the program is looking for *switch input only*, or if the program is looking for *mixed switch and keyboard input*, the AFC DIRECT-SWITCH-CONNECTION function will be operative. This means that pressing a switch will *not* cause the scanning array to appear, but will be the same as using a switch connected to the Apple's Game I/O port instead.

Mixing Inputs

The setting, `APPLEKEY = 2 (DIRECT)`, will allow you, if you use scanning or Morse code, to "have your cake and eat it to." You can use your switches for keyboard emulation up to the point of entering a game, then use the switches to play the game. The problem that remains is how to regain control in the event that you want to escape from the game. If the game goes back into a mode which looks for keyboard-input only, there is no problem. Otherwise, it might look like you're stuck. The solution to this dilemma is the special option of `STOPTIME`.

`STOPTIME` is a suboption of `APPLEKEY` which is available only when `APPLEKEY = 2` (the direct `APPLEKEY` method). By setting `STOPTIME` to any number from 1 to 255, you can create an escape hatch which will give you a way to `STOP` playing a game, by simply waiting without pressing your switch, for a given `TIME`. This waiting period is determined by the setting of `STOPTIME`. With `STOPTIME` set to 0, this escape hatch feature is turned off.

To see how this works, you can use `Shapes Dragon` on the Sample Application Disk. First, select a scanning or Morse code setup which has an `OPEN-APPLE` or `OPTION/SOLID-APPLE` character in the overlay. Set `APPLEKEY = 2` and `STOPTIME = 20`. Next, load your setup and boot the Sample Application Disk. Use scanning or Morse code to select `Shapes Dragon` and get it started. Once `Shapes Dragon` is underway, pressing the switch will *not* give you scanning or Morse code. Instead, your switch will be used as a direct input for the `Shapes Dragon` program.

Now, suppose you want to quit. Simply wait, without pressing your switch, until you hear a low tone (approximately 15 seconds for `STOPTIME = 20`). This low tone means that the AFC has returned to keyboard-emulation mode: you may now use your switches for scanning or Morse code again. This gives you a way to escape from the program. (For `Shapes Dragon`, use `ESC`.)

If you want to resume direct use of your switches to play the game, select `OPEN-APPLE` or `OPTION/SOLID-APPLE`.

The `STOPTIME` setting determines how long you have to wait, without pressing the switch, to resume keyboard emulation. (1 = very short; 255 = very long.) To experiment with `STOPTIME` settings, use `CONTROL-A 2` while using the application program. (For help with `CONTROL-A 2`, see Chapter 4.)

Summary of AFC Apple-Key Emulation

**FOR AFC APPLE CHARACTERS TO LATCH,
SET APPLEKEY = 0 (LATCHING)**

AFC OPEN-APPLE character = OPEN-APPLE key or COMMAND key (latching)

AFC SOLID-APPLE character = SOLID-APPLE key or OPTION key (latching)

**FOR AFC APPLE CHARACTERS TO BE MOMENTARY,
SET APPLEKEY = 1 (MOMENTARY) AND DURATION = 0-255**

AFC OPEN-APPLE character = OPEN-APPLE key or COMMAND key = game button 0
(pressed momentarily, for time duration proportional
to DURATION setting)

AFC SOLID-APPLE character = SOLID-APPLE key or OPTION key = game button 1
(pressed momentarily, for time duration proportional
to DURATION setting)

FOR AFC APPLE CHARACTERS TO BE DIRECT SWITCH INPUT:

- in general, SET APPLEKEY=2
 - for the normal-input method, with switches connected to the I/O box,
NO SPECIAL APPLEKEY SETTING IS NECESSARY
-

AFC switch #1 = OPEN-APPLE key or COMMAND key = game button 0

AFC switch #2 = SOLID-APPLE key or OPTION key = game button 1

Note: Using the AFC characters OPEN-APPLE plus CONTROL plus RESET will cause the disk to reboot, regardless of the APPLEKEY setting.

APPENDIX A

TROUBLESHOOTING

BASIC OPERATION

Menu Disk doesn't boot — you get a DISK I/O ERROR or CHECK STARTUP DEVICE message.

1. Make sure the AFC is in Slot 5.
2. Make sure "slots" in the Apple II GS control panel shows Slot 5 as Smart Port.
3. Try a backup copy of the Menu Disk, or make a copy of the problem disk and try out the new copy.

Application disk will not boot while the AFC is turned on.

1. Make sure the disks boots with the AFC off. If it doesn't, the problem is with the disk or the disk drive.
2. If the disk boots correctly when the AFC is off but not when it is on, turn on the special option called FIX-IT KIT, then turn on the suboption called DISK FIX. (See Chapter 5.)

Setup appears to be missing from your Extended Menu.

1. Someone may have "simplified" the Extended Menu for a particular input method. Press '9' (or use SPACEBAR or ARROWS) to go to the end of the Extended Menu. Move the cursor to SIMPLIFY/EXPAND; press RETURN. Select ALL SETUPS or the type of setup you want.

QUICK-START MENU

The Quick-Start Menu does not appear.

1. Make sure the AFC is turned on before you turn on the computer. If still no Quick-Start Menu, boot the Menu Disk with the AFC turned off to reinitialize the AFC.

The Quick-Start Menu is scrambled.

1. Boot the Menu Disk with the AFC turned off. Press '9' (or use SPACEBAR or ARROWS) to move to the end of the Extended Menu. Select OTHER OPTIONS. Choose CLEAR QUICK-START MENU. (Answer Y when asked "Do you really want to do this?")
-

SPEECH SYNTHESIZER: GENERAL

Speech isn't working in a talking overlay.

1. Is the volume control for your speech synthesizer turned on?
2. Use the Make Changes window or CONTROL-A 2 to make sure the special option of AFC.SPEECH = ON. (See Chapter 3.)
3. Make sure the Menu Disk is configured for your type of synthesizer, and (if a serial synthesizer), for the correct slot number: boot the Menu Disk. Press '9' (or use SPACEBAR or ARROWS) to go to the end of the Extended Menu. Select OTHER OPTIONS, then select CHANGE SPEECH. (See Chapter 3.)
4. If the speech feedback in the overlay was written for one type of synthesizer and you are using it with another type (eg. Echo versus external-type), you may need to edit the USER HEARS in the overlay for the speech to work correctly with the different synthesizer. (Use Make Changes ... Overlay.)

Talking Unicorn and Talking Scanner programs for the Apple IIe aren't working in the Apple IIGS.

1. Right! These programs were written for the AFC Model 2e and will not work with the AFC Model G32. Their function has been replaced by the AFC SPEECH FEEDBACK option. To create a talking Unicorn or a talking scanner, create a setup which has SPEECH FEEDBACK in the AFC overlay.

SPEECH SYNTHESIZER: ECHO

When the AFC is on, speech from the Echo is garbled with certain application programs.

1. For "older" Echo programs, make sure "system speed" in the Apple IIGS control panel is set to "normal."

While creating an overlay with speech feedback, the synthesizer does not speak the entire USER HEARS message.

1. Use a shorter total message. COMPUTER RECEIVES + USER HEARS + the Echo phonemes for USER HEARS may not exceed 255 characters.
-

SPEECH SYNTHESIZER: EXTERNAL

Speech for a talking scanner lags behind the movement of the cursor on the scan line.

The AFC does not wait for an external synthesizer to finish talking, as it will with the Echo, because the AFC does not have a way of monitoring the external synthesizer. This means that an external synthesizer may not be very satisfactory for use with a talking scanner. However, these hints may be helpful:

1. Slow down the AFC scanning rate.
2. Speed up the synthesizer. See the operator's manual for your synthesizer as to how to do this. You may need to send a special string of characters. You can do this before starting up the AFC or you might be able to add the characters to a USER HEARS message in the AFC overlay. (For example, with the Votrax Personal Speech System, you can use "@R3" for a faster speech rate.)
3. Keep your speech feedback strings short, eg. use single letters or one-syllable utterances.

The speech feedback for your selections lags behind your application program, ie. the program doesn't wait for the speech to finish.

1. This is a problem inherent in using an external synthesizer, as opposed to the Echo. See above comments.

SETUP IN EFFECT/TEST WINDOW

The SETUP IN EFFECT and/or TEST WINDOWS move from one to the other without your pressing T or ESC.

1. If the setup in the #1 position on the Extended Menu is not the NORMAL setup, these windows will change automatically if no selection is made in 35 seconds. (See Chapter 6, page 6-11.)

DISPLAY

Characters which the AFC displays (such as the scan line or CONTROL-A 1 window, etc.) are unreadable with a certain application program, or when AFC characters appear, the rest of the screen becomes unreadable.

1. Turn on the special option called FIX-IT KIT, then turn on the suboption called DISPLAY FIX. (See Chapter 5.)

UNWANTED CAPITALS

You are getting capital letters when you don't expect them.

1. If the AFC setup you are using has a CAPS-LOCK character in the overlay, the special option of AUTO-CAPS may be on. You can use CONTROL-A 2 to turn it off.
2. If you are using a program on the Menu/Construction disk (as when creating a setup), the setup in the #1 position on the Extended Menu is active. If this is any setup other than the NORMAL setup, AUTO-CAPS could be on.

AFC.LEVELS

You are using the AFC.LEVEL character to shift to Level 10, but you get Level 1 instead.

1. Use the AFC.LEVEL character, then 0 (ZERO) rather than AFC.LEVEL 10.

AFC.REPEAT FUNCTION

The AFC REPEAT function is repeating the characters too slowly or too quickly.

1. You can adjust the AFC repeat rate in two ways: (a) set the rate for the input method from 1-10 to adjust the repeat rate accordingly -or- (b) use the special option of REPEAT RATE to adjust the repeat rate without affecting the rate for the method. (See Chapter 5.)

CONTROL-A

Using CONTROL-A produces undesirable results in the application program.

1. Turn on the special option called FIX-IT KIT, then use the suboption of CONTROL-A FIX to replace CONTROL-A with CONTROL-B, CONTROL-G, CONTROL-Z — any letter that won't interfere with your application program. (See Chapter 4.)

COMMAND/OPEN-APPLE, OPTION/SOLID-APPLE

Using the AFC characters for COMMAND/OPEN-APPLE or OPTION/SOLID-APPLE is not producing the correct results in your application program.

1. You may need to adjust the special option called APPLEKEY. (See Chapter 21.)

DELETE VERSUS LEFT ARROW

The DELETE or LEFT-ARROW characters in your overlay don't work properly with your application program.

1. DELETE and LEFT ARROW are separate characters which perform different functions, depending on the application program. Use the Apple keyboard or your standard AFC overlay to determine which character works correctly with your program. Edit the overlay you want to use to put in the proper DELETE or LEFT-ARROW function. (See Chapter 7 or, for scanning, Chapter 12.)

USING SWITCHES

Brief, accidental presses of the switch are causing problems.

1. Try adjusting the special option of SWITCH DELAY. (See Chapter 5.)

AFC acts as if you're pressing a switch when you're not.

1. If a Unicorn keyboard is connected, are you touching it? Right half = switch #1, left half = switch #2. Try disconnecting the Unicorn.

Press switch — get no result.

1. Make sure AFC is on.
2. Try the OPEN-APPLE and SOLID-APPLE keys (as switch alternates). If these produce no result, use CONTROL-A 1 to check method and rate in this setup. If APPLE keys work correctly, check your switch connection and/or try a different switch.

SCANNING

The scanning array is regular-size text and you want large-size text.

1. If you are using the test window on the Extended Menu, the scanning array will always be regular size. Try using the setup with an application program. The program must use full-screen graphics.
 2. If you are using an application program and the scanning array is not large text, use CONTROL-A 2 to set SCAN SIZE = 2.
 3. If the special options are correct and the scanning array is not large text, then the application program does not use full-screen graphics. Try another application program. (See SCANNING chapter.)
-

SCANNING (continued)

You are using large-size scanning. When the cursor reaches the end of the line, it seems to keep scanning beyond the end, to characters you cannot see.

1. A large-size scanning array can only show 20 characters at one time. If the array has more than 20 characters, the cursor will keep scanning over the characters you can't see. Use the Get Information Window, then select Overlay, to get a print-out of this overlay. Use Make Changes ... Overlay to edit the overlay, or create a new setup, so that no more than 20 characters are in any array.

The scanning line is blocking an important line in the application program.

1. Use CONTROL-A 2 to adjust the special option of SCAN LINE. This allows you to move the scanning array to any line on the screen. See Chapter 5 or the SCANNING chapter.

CREATING/CHANGING SETUPS

You create and save a new setup. When the program returns you to the Extended Menu, a window says the setup has been saved, but you don't see the setup on the Extended Menu.

1. Someone may have "simplified" the Extended Menu for a particular input method. Press '9' (or use SPACEBAR or ARROWS) to go to the end of the Extended Menu. Move the cursor to SIMPLIFY/EXPAND; press RETURN. Select ALL SETUPS or the type of setup you want.

TEXT OR MOUSE/JOYSTICK MACROS, MOUSE/JOYSTICK TABS

Text macros and/or mouse macros are not executed correctly.

1. Some application programs can't handle strings of characters as quickly as the AFC sends them. Use the special option of MESSAGE RATE to slow down the message. (See Chapter 17 or 18.)
2. If the macro still isn't executed correctly, use MACRO character, then COMMA to list your messages. Review the content of the macro you are having trouble with. Set MESSAGE RATE slow enough that you can see exactly how the program executes the macro. This may help you determine if characters need to be added to the message or changed.

You get the message ALLOCATED MEMORY FULL when you try to create a macro or mouse tab.

1. Use the Macro Manager program to increase the amount of memory allocated to instant message and mouse tabs. (Enter this program via Make Changes ... Macros. See Chapter 17.)

Mouse emulation isn't working.

1. Does the Apple mouse work correctly? If not, make sure "slots" in the Apple II GS control panel shows Slot 4 as Mouse Port.
2. Did you send the AFC.MOUSE/JOYSTICK character to enter MOUSE MODE? Did the screen show "entering mouse mode"? (See Chapter 18.)

In mouse mode, the AFC "c" for click or "b" for button down works inconsistently.

1. Some application programs can't handle characters as quickly as the AFC sends them. Use the special option of MESSAGE RATE to slow down the rate at which the AFC sends characters to the Apple. (See Chapter 18.)

In mouse mode, the AFC "c" for click does not register.

1. Try a longer CLICK LENGTH. Use Make Changes ... Special Options to adjust CLICK LENGTH. (You may need to first turn on MOUSE/JOYSTICK suboption of ADJUSTMENTS.)

In mouse mode, the AFC "c" for click acts repeatedly for 2-3 times (when selected once).

1. Try a shorter CLICK LENGTH. (See above.)

The rotating arrow (SPACE) rotates too quickly or too slowly.

1. Use CONTROL-A 2 adjust the special option of ROTATION RATE. (See Chapter 18.)

The ARROW keys *or* the rotating arrow move the mouse/joystick pointer too slowly or too quickly.

1. Use CONTROL-A 2 to change ROTATION RATE -and/or-
2. Use 'P' while in mouse mode to change the small step sizes. (See Chapter 18.)

You can't escape from rotating arrow mode!

1. Press your switch or SPACEBAR when 'X' appears in the rotating arrow -or-
 2. Press any non-SPACEBAR key on the Apple keyboard.
-

The rotating arrow pops up when not wanted (eg, you are using the assisted keyboard or expanded keyboard methods).

SPACEBAR causes the rotating arrow to appear when the AFC is in mouse mode. If you don't need the rotating arrow mode and want to avoid it coming up accidentally, you can:

1. Eliminate SPACE from the overlay -or-
2. Use Make Changes ... Special Options to turn off the special option of ROTATING ARROW.
(This is a suboption of MOUSE/JOYSTICK.)

The rotating arrow idea is nice, but you can't hold down the switch to make the pointer move.

1. Use CONTROL-A 2 to set ROTATING METHOD = 1.
(See Chapter 5 or Chapter 18.)
-

SUGGESTIONS FOR REQUESTING TECHNICAL ASSISTANCE

If you aren't able to solve your problems with this troubleshooting guide, please call the company from which you purchased your AFC.

Please try to have the following information ready:

Type of computer: such as, Apple IIGS

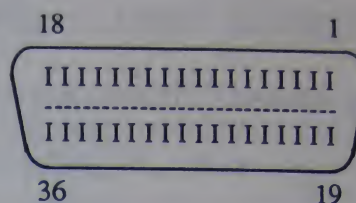
Type of AFC: such as, Model G32

Version number of your AFC Menu Disk: Look for a system software number and a date on your disk label or boot the Menu Disk, press CONTROL-I for Information, then select VERSION INFO.

A good technique is to have the telephone by your computer, so you can step through the procedures and results with the person on the phone. If this is not possible, your notes as to what you usually do and what you see on the screen (step by step) are usually helpful.

APPENDIX B

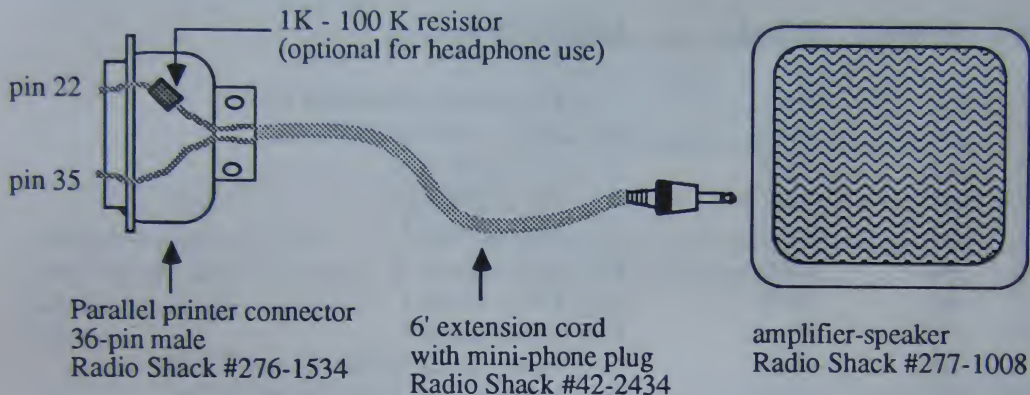
CONNECTOR PINOUTS



| PIN # | SYMBOL | SIGNAL | DESCRIPTION |
|-------|--------|--------------|--|
| 1 | A7 | Input | Exp. kbd. column P/ Switch #1 |
| 2 | A6 | Input | Exp. kbd. column O/ Switch #2 |
| 3 | A5 | Input | Exp. kbd. column N |
| 4 | A4 | Input | Exp. kbd. column M |
| 5 | A3 | Input | Exp. kbd. column L |
| 6 | A2 | Input | Exp. kbd. column K |
| 7 | A1 | Input | Exp. kbd. column J |
| 8 | A0 | Input | Exp. kbd. column I |
| 9 | B7 | Input | Exp. kbd. column H/ Parallel ASCII D6 |
| 10 | B6 | Input | Exp. kbd. column G/ Parallel ASCII D5 |
| 11 | B5 | Input | Exp. kbd. column F/ Parallel ASCII D4 |
| 12 | B4 | Input | Exp. kbd. column E/ Parallel ASCII D3 |
| 13 | B3 | Input | Exp. kbd. column D/ Parallel ASCII D2 |
| 14 | B2 | Input | Exp. kbd. column C/ Parallel ASCII D1 |
| 15 | B1 | Input | Exp. kbd. column B/ Parallel ASCII D0 |
| 16 | B0 | Input | Exp. kbd. column A |
| 17 | ON/OFF | Input | AFC ON if connected to +5 (pin 30) |
| 18 | NC | | |
| 19 | C7 | Output 0/+5 | Exp. kbd. row 8/ Parallel ASCII SELECT |
| 20 | C6 | Output 0/+5 | Exp. kbd. row 7/ Parallel ASCII BUSY |
| 21 | C5 | Output 0/+5 | Exp. kbd. row 6/ Serial ASCII XON/XOFF (alternate) |
| 22 | C4 | Output 0/+5 | Exp. kbd. row 5/ External speaker, headphones |
| 23 | C3 | Output 0/+5 | Exp. kbd. row 4 |
| 24 | C2 | Output 0/+5 | Exp. kbd. row 3 |
| 25 | C1 | Output 0/+5 | Exp. kbd. row 2 |
| 26 | C0 | Output 0/+5 | Exp. kbd. row 1 |
| 27 | RXR | Output -5/+5 | Serial ASCII XON/XOFF handshaking: to RXR (pin 3) |
| 28 | DTR | Output -5/+5 | Serial ASCII DSR/DTR handshaking: to DTR (pin 6) |
| 29 | NC | | |
| 30 | +5 | Output | +5v via 560 ohms. Install jumper for true 5v. |
| 31 | STB1 | Input | Parallel ASCII STROBE input (active low) |
| 32 | LED1 | Output | 100 ohms to +5 (anode of LED indicator light) |
| 33 | LED2 | Output | Active high. Goes low when AFC on (cathode of LED) |
| 34 | STB2 | Input | Serial ASCII data in, from RS 232 TXR (pin 2) |
| 35 | GND | Output | Ground via 560 ohms. Install jumper for true ground. |
| 36 | NC | | |

USING EXTERNAL SPEAKER/HEADPHONES WITH AFC

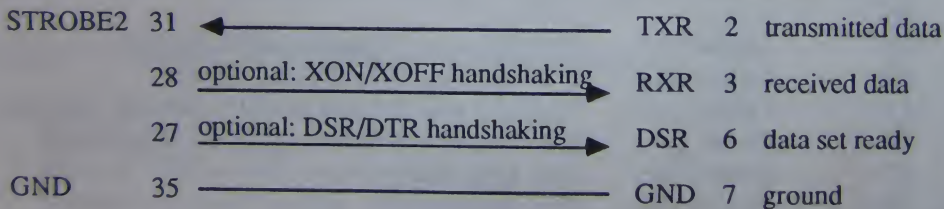
When the special option CLICK FEEDBACK is set to OFF, the normal auditory feedback for scanning, Morse code, and assisted keyboard is sent to pin 22 of the AFC's I/O box instead of to the Apple's speaker. An external speaker or headphones may be connected to the I/O box as shown.



RS232 SERIAL ASCII CABLE

AFC: Centronix
36-pin male connector

RS232
DB 25 connector

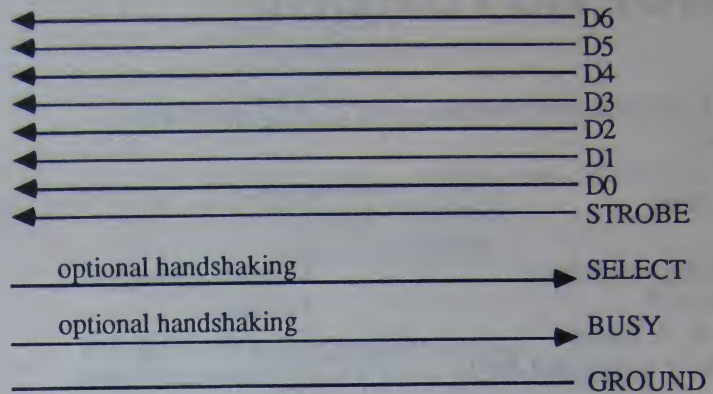


Note: DSR/DTR handshaking: +5 send, -5 halt
XON/XOFF handshaking: CTRL-S = halt, CTRL-Q = resume
handshaking not fully supported prior to AFC-G32 revision D

PARALLEL ASCII CABLE

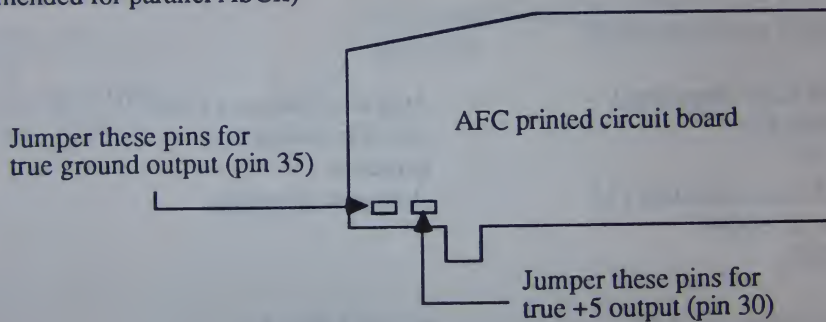
AFC: Centronix
36-pin male connector

Parallel output

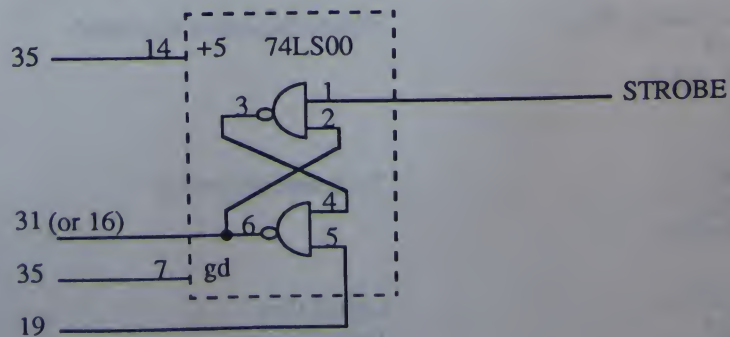


Jumpers for +5, GND Output

(Recommended for parallel ASCII)



Strobe-Latching Circuit for AFC-G32 pre-revision D



Note: Connect +5, GROUND jumpers as shown above.

APPENDIX C

MANUFACTURERS

Adaptive Communication Systems
Box 12440
Pittsburgh, PA 15231
412-264-2288

ACS SpeechPAC

ComputAbility Corporation
101 Route 46 E.
Pine Brook, NJ 07058
800-345-4076 or 201-882-0171

Multiple Switch Box
Switches
Computer keyguards
Membrane keyboards

Digital Equipment Corporation
146 Main St.
Maynard, MA 01754-2571
800-832-6277 or 617-493-3113

DECtalk Speech Synthesizer

Don Johnston Developmental
Equipment, Inc.
PO Box 639
1000 Rand Road, Building 115
Wauconda, IL 60084
312-526-2682

Adaptive Firmware Card
Multiple Switch Box
Switches
Computer keyguards

EKEG Electronics Co. Ltd.
PO Box 46199, Station G
Vancouver, BC, Canada G1V 1N6
604-273-4358

Narwhal Board

Exceptional Computing, Inc.
415 NW 58th St.
Gainesville, FL 32607
904-374-8847

Florida Expanded Keyboard

Hanover House
101 Kindig Lane
Hanover, PA 17333

TV Screen Magnifier

Prentke Romich Co.
1022 Heyl Road
Wooster, OH 44691
800-642-8255 or 216-262-1984

Light Talker
Touch Talker
Switches
Computer keyguards

Street Electronics Corporation
P.O. Box 50220
Santa Barbara, CA 93150
805-565-1612

TASH, Inc.
70 Gibson Drive, Unit 12,
Markham, Ontario
Canada L3R 4C2
416-475-2212

Unicorn Engineering Co.
6201 Harwood Ave
Oakland, CA 94618
415-428-1626

Votrax, Inc.
1394 Rankin Dr.
Troy, MI 48033
800-521-1350 or 313-588-2050

Zygo Industries, Inc.
PO Box 1008
Portland, OR 97207-1008
503-297-1724

Echo Speech Synthesizer

King Keyboard
Mini Keyboard
MOD Keyboard Systems
Switches
Computer keyguards

Unicorn Expanded Keyboard
Dead Spot Eliminator
Unicorn keyguards

Personal Speech System
Type 'N' Talk Speech Synthesizer

Communication devices
Switches

APPENDIX D

SOFTWARE PUBLISHERS

Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
408-996-1010

Alex the Rabbit, Apple Access II
Apple Presents Apple
AppleWorks, Apple Writer II
Lemonade Stand

Birch, Jana Blackstone
2346 Wales Dr.
Cardiss, CA 92007
619-942-3343

Catch the Cow

Broderbund Software, Inc.
17 Paul Dr.
San Rafael, CA 94903
415-492-3200

Bank Street Writer
Bank Street Writer Plus

ComputAbility Corporation
101 Route 46 E
Pine Brook, NJ 07058
800-345-4076 or 201-882-0171

Customized setups for
Unicorn Keyboard

DLM
One DLM Park
Allen, TX 75002
800-527-5030 or 214-248-6300

Arcademic Skill Builder in Math –
Setups for the Adaptive Firmware
Card

Don Johnston Developmental
Equipment, Inc.
PO Box 639
1000 Rand Road Building 115
Wauconda, IL 60084
312-526-2682

Interaction Games
Motor Training Games
Single Input Control Assessment
Symbol Writer

Dynacomp, Inc.
1064 Gravel Rd.
Webster, NY 14580
800-828-6772 or 716-671-6167

Hodge Podge

Easter Seals Communication Institute
24 Ferrand Dr.
Don Mills, Ontario
Canada M3C 3N2
416-421-8377

Single Input Control Assessment

Edmark Corporation
PO Box 3903
Bellevue, WA 98009
(800) 426-0856

Edmark Reading Program
(Level 1)

Epyx, Inc.
PO Box 8020
600 Galveston Dr.
Redwood City, CA 94063

World Games

Exceptional Children's Software, Inc.
PO Box 4758
Overland Park, KS 66204
(913) 831-3800

The Rabbit Scanner

Hartley Courseware, Inc.
P.O. Box 431
Dimondale, MI 48821
800-247-1380 or 517-646-6458

Dr. Peet's Talk/Writer
My Words

Laureate Learning Systems, Inc.
110 East Spring St.
Winoski, VT 05404
802-655-4755

Creature Antics
First Words

The Learning Company
545 Middle Field Rd.
Menlo Park, CA 94025
800-852-2255 or 800-852-2256 (in CA)

Reader Rabbit

Marblesoft
21805 Zumbrota NE
Cedar, MN 55011
(612) 434-3704

Early Learning I

Polarware
1055 Paramount Pkwy, Suite A
Batavia, IL 60510
(312) 232-1984

The Sesame Street Crayon

Pyramus Software
12810 NE 135th St.
Kirkland, WA 98034

Talking Animated Graphics

Random House, Inc.
201 East 50th St.
New York, NY 10022

Charlie Brown's ABC's

Scholastic Software
730 Broadway
New York, New York 10003

Talking Text Writer

Spinnaker Software Corp.
One Kendall Square
Cambridge, MA 02139

Golden Edition Facemaker
Grandma's House
Story Machine

Sunburst Communication
39 Washington Ave.
Pleasantville, NY 10570
800-431-1934 or 914-769-5030

Magic Slate

Unicorn Engineering Co.
6201 Harwood Ave
Oakland, CA 94618
(415) 428-1626

Setups for the Unicorn Keyboard:
Up and Running

Weekly Reader Family Software
25 Long Hill Road.
Middletown, CT 06457

Stickybear ABC
Stickybear Opposites
Stickybear Shapes

Wm. K. Bradford Publishing Co.
594 Marrett Rd.
Lexington, MA 02173
617-862-2822

Explore-a-Story

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